INSTITUTE of STATISTICS
Oxford

Bulletin Vol. 8 *May 1946* *No. 5*

THE BUDGET AND RECONSTRUCTION

The Budget has received praise in many places. From a limited fiscal point of view, this praise was well deserved, but a more critical aspect appears when we view budgetary policy in the context of the tasks and requirements of reconstruction as a whole.

On a general plane, the Chancellor's approach is highly orthodox : he is thinking in terms of finding revenue to finance an expenditure which is somehow determined by various considerations, and his aim is a budget which should be balanced, if not in a given year, at least over a number of years. For the current year, he aims at coming ' within striking distance of a balanced budget '. The idea of drawing up a budget in terms of manpower, mentioned last autumn, has not been put into practice. The budget deficit is not viewed in relation to other relevant items, like private investment, foreign borrowing, and saving propensities. Yet if it is seen in this framework, it would appear that there is no reason why, in future years, a budget balanced over a period of years should always be in keeping with the aim of full employment; nor is it clear that at present, in view of the large piled-up demand, a balanced budget would in itself contribute very much to eliminating the danger of inflation. Indeed to think in purely revenue-expenditure terms may often be misleading : from the purely fiscal point of view, the expenditure of £100 million on defence is the same as £100 million spent in tax reliefs; but its effects on the overall situation may well be quite different.

More specifically, it may be asked how far the budgetary policy will assist reconstruction. The Chancellor has recognized the importance of incentives for entrepreneurs by abolishing E.P.T. as from Dec. 31st, 1946. This decision has been made easier by the fact that, owing to the time lag in collection, the effect on revenue will not be felt for some time to come. On the other hand, however, there has been no corresponding recognition of the importance of the incentive to work. The concessions made in this respect —an increase of the earned income allowance to one-eighth as compared with one-fifth before the war, relief of insurance contributions from income tax, and an increase in wife's earned income allowance, will altogether bring only half a million people out of the income tax structure. The need for greater incentives can be shown by a few considerations.

The labour question is at present probably the most important of all, the key to reconstruction. This is shown by the number of industries where production is held up mainly by lack of labour—agriculture, coal, building materials, housing, textiles. It is confirmed by the government's repeated appeals for more work. These appeals may have some effect, but only if they are accompanied by a positive and well thought-out policy. Broadly speaking, the aim of such a policy would be to increase (or maintain) the labour force, especially in ' critical ' bottleneck industries, and to increase output per man. This requires various encouragements to induce a shift of manpower to critical industries : first all wage increases in these industries sufficient to create a wage differential in their favour, and secondly, various non-monetary incentives such as improved working conditions, differential rations, improvement of local housing conditions, etc. The increase in output per head will also be influenced by these factors; in addition, it requires an increase in the *marginal* rate of remuneration, which at present is reduced by the incidence of income tax. Ten and a half million people will still be paying income tax after the present concessions have come into force; of these about five million are workers. To get the bulk of workers out of the income tax scheme would mean an increase in the marginal rate of remuneration, and therewith a greater incentive to work. It is sometimes argued, it is true, that the effect might be the opposite : in so far as the income tax reliefs would increase not only the marginal but also the average rate of remuneration of work, and since, owing to scarcities, workers have few opportunities for spending additional money, and do not care to save more, they will simply ' buy more leisure ' by way of increased absenteeism. The assumptions made in this argument seem to have very limited application. They are more plausible for mining villages and the countryside than for towns where entertainments and holidays alone provide a considerable inducement for increased earning. Even in the former case, however, workers are probably keen to get a share in the products which are now beginning to come on the market. That savings are not worth any effort for young people who at some time will have to set up a home, or for older ones who want to provide for their children, is also a highly unrealistic assumption. We may, therefore, conclude that the inducement of greater earnings is still a strong factor.

The effects of a relief from income tax payment for most workers can be summarized under the following headings :

1. In case of all piece work the increased marginal rate of remuneration would induce greater effort, and therefore greater output per head. This factor is important in a few of the key industries (e.g. coal, dock labour, engineering).

2. Overtime working would be encouraged. Even though overtime for industry as a whole is less common now than during the war, it must obviously be, actually or potentially, very important for the bottleneck industries where manpower is lacking.

3. An increased marginal rate of remuneration will, in general, reduce absenteeism. This is probably a very important factor in a great number of industries. If a day's leisure is made to cost anything up to 65 per cent more than it cost before,[1] it will probably be foregone to a considerable extent.

4. As mentioned before, it will be necessary, in order to increase, or even only to maintain, the manpower in certain industries, to increase wages so as to create a wage differential in favour of these industries, capable of attracting labour. If such proper wage differentials are to be created and if the additional earnings offered by employment in the ' critical ' industries are taxed at, say, 39½ per cent,[1] then the wages differential would have to be 65 per cent higher to have the same effect as when additional earnings are not taxed at all. In other words, if you eliminate, to a large extent, the direct taxation of wages, then the required increase in wages in the critical industries, relative to other industries, will be considerably less, with equal effectiveness.

5. Finally, additional workers will be drawn into the labour force, and the existing labour will be kept in it, much more easily if income tax on wages is eliminated. Although the allowance for an earning wife has been raised from £80 to £110—to the level of the personal allowance of an unmarried man—it is certain that a great number of earning wives will pay a considerable amount of tax (the average weekly earnings of women were over £3 last summer, about £150 a year). In families where the husband's earnings alone make him liable to 39½ per cent rate of marginal taxation, and where the wife's earnings are rather above the average, the tax paid on the wife's earnings may be a considerable proportion. In a certain number of cases this may influence her decision whether it is worth while for her to work at all, considering the cost and inconvenience which it involves. This factor is probably less important than the others mentioned before, but it should by no means be neglected. It has been claimed that, after the decontrol of labour, women would leave the engineering industries in great numbers, unless their wages were raised. If this claim is true, it follows that the point raised here must be of practical importance.

It must be stressed that the incentives provided by a relief from income tax are only part of an adequate labour policy. Wage increases in the critical industries are required simultaneously. It may, however, be claimed, that the *general* upward pressure of wages which exists for understandable reasons (loss of earnings due to elimination of overtime), could be stalled more easily, if complete relief from income tax were given to the bulk of the workers. It is easy to recognize the validity of the following principle : if any general benefits are to be given to the workers, it is preferable to give them in the form of income tax relief, rather than in the form of general wage increases, or in the form of reduced indirect taxation. This is because in the first case the *marginal* rate of remuneration and thereby the incentive is also increased. Relief from income tax should, therefore, have priority over *general* wage increases and reductions of indirect taxation.[2]

---

[1] This corresponds to a rate of taxation of 9s. in the £, with 12½ per cent earned income allowance.

[2] Income Tax relief should be given in form of increased personal allowances as a first priority ; restoration of the pre-war earned income allowance of one-fifth might be considered next.

What would be the cost of this policy ? Before the war only about a million workers were paying income tax. We could presumably get back to a similar position, if the personal allowances were raised to the real value of pre-war times : that is, allowing for a 50 per cent increase in market prices of consumers' goods, to £165 unmarried, and £270 married. To take a more modest aim, let us imagine that in both cases the allowance is raised by £75 over the present level of £110 for single and £180 for married people. The Chancellor said that the relief of workers and self-employed persons' contributions to social insurance under the new insurance scheme will correspond to a personal allowance of £11, and that it will cost £40 million in a full year. Thus an increase in personal allowance by £75 could not cost more than £280 million in a full year[1]. In fact, it must cost considerably less, because each successive £11 of the increase in the allowances will bring a certain number of persons out of the scheme, or transfer them to a lower rate of taxation, and therefore fewer persons will remain to be relieved by the next £11 of the increase. Something of the order of £250 millions is probably a high estimate of the cost involved. (As the change could have been made effective only from October, the burden in the current year would be half the figure mentioned). To this have to be added the amounts which wage increases in critical industries will require in subsidies, if prices are to be kept stable.

How could this possibly be financed ? The answer would be easier if the Chancellor had not poured out, quite needlessly, £120 millions for the reduction in the standard rate in last autumn's budget. The entrepreneurs were in no particular need of this incentive at a time of assured markets and correspondingly low risks, and in addition to the reduction of E.P.T. Moreover, in contrast to the E.P.T. reduction, the decrease in the standard rate by 5 per cent of gross income is so small as to be of negligible effect on incentive.

Another of the missed opportunities is to be found in connection with defence expenditure which, apart from ' terminal items ' is £1,100 millions this year. We need not question the ultimate target of defence forces (1.2 million men in the armed forces and 0.5 million in supply at the end of 1946), but it is fair to ask what has been gained by approaching this target so slowly.

If the above lines of approach are barred, the cost of increased allowances (as well as that of wage increases in critical industries) would increase the deficit. Could such a policy be risked ?

THE ' FEAR OF INFLATION '

How much pressure of inflation is there likely to be in the current financial year ? The budget deficit is given as £725 millions. From this have to be deducted the £50 millions carried to a special fund for the acquisition of land (which will be only partly spent and in any case will not influence effective demand). A certain part of ' terminal payments ', such as payments to manufacturers for contracts finished already, will also have little influence on current effective demand. These payments have no effect on consumption, and although theoretically they could affect investment, they are unlikely to do so while the latter is limited by scarcity of labour and materials rather than scarcity of funds. The borrowing for E.P.T. refunds and for compensation payments for war damage is rightly left out of the deficit, for the same reasons. Thus the relevant deficit is at most £675 millions. It is more than offset by foreign borrowing, which the Chancellor estimates at £750 millions for the Calendar year 1946.[1] Thus all internal savings will be available for the finance of reconstruction (private and local government investment).

---

[1] It is true that since the insurance contributions are not paid by all taxpayers, whereas an increased personal allowance would benefit all, the cost of the latter should be higher. But the difference should not be great, because most taxpayers, especially in the lower income ranges, will be paying insurance contributions either as employees or self-employed persons.

We have little to go on for an estimate of gross investment in fixed capital by private firms and local authorities in the current financial year. It is not unreasonable to assume, in view of the manpower situation in building, etc., that the real volume of investment can hardly exceed the level of pre-war years. The 1938 gross investment in fixed capital has been estimated by Mr. Maizels at £770 millions.[2] Assuming a price increase for investment goods of 70 to 80 per cent from 1938 to 1945—admittedly a very rough estimate[3]—the present value of this investment would be about £1,300 to £1,400 million at 1945 prices. There will be a certain amount of restocking with goods for civilian consumption, but this will presumably be more than offset by the decrease in privately financed working capital in the armament sector. Thus the total gross investment of private firms and local authorities is not likely to surpass the *upper limit* of £1,400 million in the present financial year.

We may try to estimate the ' normal saving ' for the same period, i.e. the saving which would be forthcoming if there were peace-time conditions, and saving habits the same as before the war. We take as a basis of comparison the year 1939. Personal income net of direct taxtion (but gross of death duties and the excess of tax liabilities over payments) in 1939 was £4,605 millions, which amounts to £6,905 millions in 1945 prices. In 1945, personal income net of direct taxation was £7,041 millions. In the present financial year (1946–47) personal income, in real terms, may fall ; Mr. Champernowne, in the same issue of this BULLETIN envisages a fall in real national income of up to £500 millions.[4] On the other hand, there will be a reduction in income tax by £317 millions. If we deduct the balance from the 1945 personal income net of direct taxation we get £6,860 millions for the present financial year, assuming prices unchanged as compared with 1945.

---

[1] On the assumption that the American loan would go through. The foreign borrowing in the financial year 1946–47 will presumably be somewhat lower, and can be assumed, therefore, to balance the budget deficit.

[2] *Economica*, 1149, p. 158. See also T. Barna *Redistribution of Incomes*, p. 251.

[3] Building costs have risen by 90 to 100 per cent, while the cost of machinery and equipment has increased considerably less.

[4] This apparently contradicts the Chancellor's assumptions, as he budgeted for an increase in income tax revenue. That might nevertheless be correct if there were a price increase (which would, of course, be of a type which does not influence the official cost of living index.)

The *real* personal income (net of direct taxes) in 1946–47 will therefore be of the same order as in 1939. We conclude that personal savings of 1939, in real terms, will give a good estimate of the ' *normal savings* ' in the current financial year. Gross personal savings (i.e. including death duties and excess of tax liabilities over payments) in 1939 were £334 millions, i.e. at 1945 prices, £500 millions. Deducting death duties, etc., net personal saving would become about £350 millions. If we assume entrepreneurial saving with £210 million, and depreciation with £520 millions to remain at the level of 1945, the ' normal ' gross private saving becomes £1,080 millions. Seeing that there may be a small surplus in the ordinary budgets of local authorities (excluding all capital expenditure) and in the extra-budgetary funds, the *normal* saving available will be of the order of £1,100 to £1,200 millions (at 1945 prices).

As the investment of £1,300 to £1,400 million is in excess of this ' normal ' saving, it appears that abnormal saving will have to continue to play a role. It does not follow from this, however, that the total piled-up demand for consumer's goods (excluding housing) will continue to increase. A part of the abnormal saving does not, generally, involve at all a piling up of demand for consumption goods : the abnormal saving that is created by the reduction of food consumption through rationing, or the reduction in other non-durable goods or services, does not give rise to any piling up of demand for these goods or services. Moreover, even with semi-durable and durable goods, the piling up of demand for them amounts to less than the amount of potential consumption which people forgo during the time of scarcities. We shall not buy all the shirts or shoes which we have been prevented from buying during the war, but shall only replenish a normal wardrobe, once shirts and shoes become available. In most cases the piling-up therefore reaches a limit after a certain time. Thus we may conclude that, if the above assumptions about normal saving and about investment are correct, the *total* pile-up will certainly not increase, but rather tend to decrease. (For some goods, of course, there will be a further pile-up owing to their continuing scarcity, but this will be over-compensated by an absorption of piled-up demand in other lines where ample supplies are becoming available).

Does the picture given above indicate any danger of inflation ? Yes and no. Potentially the pressure of the piled-up demand is always with us during the reconstruction period, and if it were released by abolishing rationing and controls it would produce a considerable inflation even if there were a large budget surplus. And it is fairly certain that this pressure of piled-up demand, together with the demands for housing and re-equipment, will be heavy for a number of years to come.[1] In this sense Mr. Dalton seems to be too optimistic when he says ' . . . the danger of inflation will gradually recede, and I hope that in a year or two at the most we shall be able to say : " Well, that danger is now behind us; we have surmounted it " '.[2]

---

[1] See the estimate of the length of the reconstruction period given by Mr. Kalecki: Bulletin, Vol. 6, No. 17.

[2] Weekly Hansard, No. 12, p. 2197 (April 11, 1946).

But on the other hand this pressure is at present fairly well controlled, as it was during the war. It may be suggested that an increase in the deficit in the circumstances has not the importance which the Chancellor ascribes to it. In fact, if we could, by some miraculous stroke of fortune, overcome the terrible bottleneck in building and build twice as many houses the effect would be quite the same as that of an increase in the deficit, yet nobody in his senses would regard it as anything else but a favourable development. This does not mean advocating a light-hearted increase in spending, but it does mean that the disadvantages of an increase in spending power can reasonably be faced, if they offer the chance of a sizeable increase in production.[1] Spending is to a large extent controlled, and the effects of an increased purchasing power would be largely limited to the ' free sector ' : entertainments, holiday resorts, etc.[2] A large part of the additional purchasing power would perforce be saved.

The moral of this is that the size of the ' inflationary gap ' (the difference between *investment* + *budget deficit—foreign borrowing* and *normal saving*) is of relatively small importance to-day as compared with the plain aim of an increase in production. An increase in the inflationary gap through an increase in incomes will not increase very much the pile-up (because of the limits to the piling-up process mentioned above). Any increase in production on the other hand will either *pro tanto* reduce the pile-up, or by way of industrial re-equipment, make its later reduction possible.

THE ' HOPE OF INCENTIVE '

An increase in the budget deficit can therefore be justified, if it is incurred for the purpose of bringing about a substantial increase in production. The increase in income tax allowances (as well as increased subsidies which would be necessary to finance wage increases in critical industries) would fulfil this condition.

In considering the effects of incentive on production we must distinguish the direct and immediate effects, and the indirect effects. The direct effects would appear in an immediate and presumably lasting increase in output per head in the industries concerned (which are mainly mining, manufacturing and building).

The indirect effects follow from the nature of the reconstruction economy in which bottlenecks play a large role and in which, at present, the process of reconversion is far from completed. It is easy to give examples of bottlenecks : shortage of building materials which holds up housing, shortage of material in furniture and in the textile industry. Bottlenecks may also arise from the complementarity of goods (house structures and fittings, of which, on the whole, the former seem to be the bottleneck). Finally there exists a bottleneck of the greatest significance in the tightness and uncertainty of the foreign exchange position : in so far as any increase in exports would make possible greater imports of raw materials and machinery,[1] and in so far as the main restriction on exports is at present not lack of markets but lack of production, we can consider the production of all export goods as a bottleneck. The incomplete reconversion is seen in the examples of factories not yet re-opened, or not yet converted to peace-time production, and in the lack of machinery (for example, electrical machinery, like motors).

---

[1] Just as during the war these disadvantages were suffered in view of the paramount need for defence.

[2] The free sector comprises also a number of goods, which are not rationed or licensed, e.g. certain household goods like crockery, pots and pans, stoves, electric equipment ; it so happens that to a large extent just these goods seem to come in more plentiful supply, so that an increased demand for them would, in most cases, probably not create critical shortages.

Under these circumstances the following indirect effects of incentives which would work out in time only and would partly depend on a combination of tax incentives with differential wage increases, would be important :

(1) An increase in productivity in the sector of *investment* (repair and clearing of factories, production and installation of machinery, re-conversion in the narrower sense, building of dwelling houses for workers in the appropriate location etc.) would *increase the pace* of reconstruction; this would be particularly important where these activities concern bottleneck industries (opening of brickworks, mechanization in coal mines).

(2) An increase in exports would make it possible to import more machinery with which to re-equip and modernize industry. This would again hasten the pace of reconstruction and make possible an increase in output per head in the following period. (This would be, of course, particularly important where dollar exports are concerned).

(3) If there is a bottleneck, say, in building materials, it means that the available labour force in building is underemployed. (It is plausible to assume that a large part of the present unemployment of 370,000 is due to bottlenecks; apart from this there are of course less visible forms of under-employment.) If productivity in the bottleneck industry (bricks) rises by say 3 per cent, it means that the output in the whole dependent sector, in this case building, increases by the same amount. Of course, if productivity in building rises, too, there will again be under-employment. A general rise in productivity would, however, set free labour in those industries where an increase in output is not required, and therefore create better conditions for finding suitable labour to be drawn into the bottleneck industry. This process requires special measures, like wage increases in the bottleneck industries, etc. As has been shown above, however (see p. 123), these differential wage increases will be more effective if the direct taxation of wages is to a large extent abolished. In conjunction with differential wage increases, the indirect effect of tax incentives would be to make the breaking of bottlenecks easier, and thus, after a time, increase output by a greater

---

[1] This might not be the case where there are supply bottlenecks in the producing countries.

proportion than the consideration of only the direct effect would indicate.

It must be admitted that, in view of the lack of suitable material (e.g. field surveys), the effects of inventives are not measurable. On a reasonable judgment, however, they would seem to offer a good chance of increasing output, and this is sufficient justification, in the words of the Chancellor, for putting the ‘ hope of incentive above the fear of inflation ’.

J. STEINDL.

THE NATIONAL INCOME AND EXPENDITURE OF THE UNITED KINGDOM 1938–1945.

1. The Scope and Purposes of the White Paper[1] on National Income and Expenditure.

The White Paper[1] on National Income, which was published in April 1946, is the first of this series of White Papers which has includes the entire period of the War. It discloses balance sheets of the nation's income and expenditure in each year 1938 to 1945 inclusive, set out in a form designed to show the changes in the way the country's resources have been distributed between different uses.

In order to get the most information out of this Paper, it is useful to remember the purposes for which it was originally designed. These purposes were primarily educational. There used to be, both outside and inside the Civil Service, considerable confusion of ideas about Government finance by means of borrowing: in particular, people used to confuse the economic effects of an internal debt on the part of the Government to its own nationals with those of an external debt on the part of the nation to creditors overseas. There was also the mistaken belief that heavy Government expenditure out of borrowing was bound to cause so great an expansion in the quantity of money as largely to destroy its value by driving up prices. Such confusion of thought and such anxieties threatened to hamper the successful conduct of the Treasury's plans for paying for the war. Accordingly, they decided to publish an annual White Paper setting out as clearly as possible what was being done with the nation's money and demonstrating that the whole of the Government's spending was being financed from genuine sources; by the regular disclosure of authoritative figures in the White Paper, the Treasury took the wind out of the sails of the alarmists and reassured the informed public as to the value of money and the soundness of the country's financial position.

To-day, the primary function of the White Paper still is to provide the public and the Civil Service with a summary account of the nation's finances, but it gives more than this. It provides money terms, a useful indication of the structure of the country's economic activity in each year. Being no more than a piece of accountancy expressed in the form of balance sheets, it only tells us about money matters: for detailed information about specific resources such as man-power or particular materials and items of capital equipment, we must consult other publications of the Central Statistical Office, such as their monthly *Statistical Digest*. But a great many of the most important questions which arise in any general review of the nation's economic activity can be expressed in terms of money, and on the answers to such general questions the White Paper will shed considerable light.

2. Changes in Prices 1938–1945.

Although the White Paper deals only with amounts of money, it can tell us a certain amount about production in terms of 'real' values, if we make some correction for the changes in the value of money from one year to another. For any such comparison, a rough knowledge of the way in which the purchasing power of the £ sterling fell (or in other words how prices rose) during the periods, is an essential preliminary. In some earlier White Papers, an index number of the prices of consumer goods and services was provided, and it was a most valuable piece of information, since it was the only complete index of the cost of living published officially in this country. In more recent numbers, strangely enough, no figures of prices are directly provided.

---

[1] Cmd. 6784. Price 9d.

Tables 9 and 10 of the White Paper do, however, provide all the information needed for calculating a fairly accurate index number of the prices of consumer goods. Table I, below, shows index numbers of prices comparing the price levels of earlier years with that of 1945 taken as 100. The first index number, for market prices, shows the change in the cost at market prices of those goods and services which consumers bought during the period 1938–1945.[1] The second index number given, namely that of national[2] cost, shows how the costs of the same range of goods to the nation has changed during the same period: market prices of goods often include payments to cover indirect taxes on the one hand and are often reduced by Government expenditure on subsidies on the other hand: the market prices of goods such as beer and tobacco, subject to indirect taxation, obviously exceed their actual cost to the nation, whereas the market prices of subsidized goods, such as milk, are obviously less than their real cost to the nation. The index numbers of national cost include the effects of correction for the influence of subsidies and indirect taxes. In any comparison of personal incomes in one year and another, one must bear in mind the changes in the market prices of the goods which those incomes may purchase, and in any comparison of the value of the nation's production in one year and another, one must remember the changes in the national costs of the goods produced.[3]

TABLE I

Index Numbers of Prices of Consumer Goods. 1945=100.

United Kingdom	1938	1939	1940	1941	1942	1943	1944	1945
Market Price	65.4	67.0	78.5	87.3	92.0	97.2	99.2	100.0
National Cost Price ...	67.6	68.7	79.6	86.4	91.6	94.0	97.4	100.0

It will be seen that the increases of market prices and national costs have both been very moderate, especially since 1941; when it is remembered that prices more than doubled during 1914–1918, it will be admitted that the less orthodox financial policy of the Treasury in the second World War certainly did not destroy the value of money to the same extent as the more 'orthodox' policy followed in the earlier war.

[1] The range chosen strikes an average between the kinds of goods which people bought before the war in 1938, and those which they were buying at the end of the War in 1945. It was found, however, that quite large variations in the composition of the range of goods chosen made remarkably little difference to the resulting index numbers of market prices.

[2] The Central Statistical Office now use the term 'National Cost' to express that which was called 'Factor Cost' in earlier white papers.

[3] See *Econ. Journal*, March, 1946, p. 41. (Ursula Hicks: Tax Analysis).

Nevertheless, the tremendous expenditure out of borrowing inevitably impoverished the country to some extent, and the White Paper provides, very useful figures illustrating the extent and manner in which the country is poorer to-day than it was in 1938.

3. THE EFFECTS OF THE WAR-TIME BORROWING.

Table II, below, summarizes the figures given in Table 19 of the White Paper. It shows how the Government derived its borrowing mainly from three sources. The first of these was the using up of our overseas assets, and the incurring of liabilities overseas : the second was the using up of private stocks of goods, allowance of our buildings and productive equipment to fall into disrepair and the discontinuance of investment in additions to our buildings, equipment, etc.[1]; the third source was the increase in the savings of the British people. The heavy borrowing from the first source has undoubtedly weakened this country's economic position in trade with other countries : the prolonged use of the second source must have lowered the country's productive efficiency in comparison with what it would otherwise have been in 1945; the use of each of the three sources may have created certain administrative difficulties by increasing the amount of income which has to be transferred annually within the country to pay the interest on the swollen internal National Debt.

TABLE II

Sources of Government Borrowing 1939–1945.

	£ million
Net Sale of Assets and Increase of Liabilities to Countries Abroad	4,691
Sums released by running down domestic capital equipment and stocks :	
(*a*) Private	1,757
(*b*) Local Authorities	96
Saving :	
(*a*) Private	9,115
(*b*) Extra-budgetary funds and Local Authorities	860
Central Government net borrowing	16,519

Let us consider the magnitude of these three effects. From Table II, we see that during the seven years 1939 to 1945 inclusive, we used up our foreign assets (and increased our foreign liabilities) by nearly £5,000 million, which represents the value of over seven months of the national output at present prices. This has been the chief factor reducing our net income from overseas from £200 mn. to nearer £50 mn. The result is that we should need to produce and market overseas an extra £150 million's worth of goods every year in perpetuity to restore the balance of our overseas trade : alternatively, of course, we could control imports and restrict them to the same extent, provided that this in turn led to no loss of export markets. Since the total of our pre-war exports, expressed in 1945 prices, was only £900 million, the need to provide the extra £150 million a year is a heavy burden, and it is in respect of this deterioration of our position in international trade that the economic cost of our borrowing for the war has been the most serious.

---

[1] Except for additions for the purposes of war production.

The effect of the war on our productive equipment is very difficult to assess. We can see from Table II that the value of the resources deflected from the maintenance and repair of our buildings and equipment to war purposes totalled £1,853 million during the seven years: part of this sum represents a transfer of stocks from private to public hands, but the result is that we are now left with an acute housing shortage and with antiquated and insufficient capital equipment. For some years to come, the loss will be felt in the form of overcrowding and lowered productive efficiency.[1] On the other hand, it may be hoped that some of the improvements and additions to productive equipment carried out for war purposes may turn out to have lasting value in times of peace as well. The total loss of £1,853 million may, therefore, overstate the seriousness of the position.

The increased saving by the British people during the war involved some inconvenience at the time, but leaves no permanent economic loss. There only remains the question of administrative difficulties involved in the need to transfer a larger amount of income each year as interest payments on the internal National Debt. This inconvenience is trifling compared to the real economic losses involved by the deterioration of our position in international trade, and by the net loss of housing and capital equipment. Table III shows how the government's internal debt has increased. A measure of the administrative difficulties created is given by the fact that the cost of interest payments on the internal National Debt has risen from approximately £200 million per annum before the War to £423 million in 1945: the pre-war amount represented about 4½ per cent of the national income at that time whereas the present amount represents 5 per cent of the 1945 national income. This increase is not serious, and if, as we may hope, the national income continues to increase at the pre-war rate of about 1½ per cent per annum, whereas the internal National Debt does not increase by more than ½ of 1 per cent per annum, the magnitude of the administrative problem will be rapidly reduced towards its old level.

TABLE III

Channels of Central Government Finance 1939–1945.

	£ million
Increase of deposits at Post Office and Trustee Savings Banks	1,567
Increase of National Savings Certificates and Accrued Interest	1,355
Issues of Defence Bonds	897
Other Public Issues (net)	5,787
Increase in Fiduciary Issue	790
Increase in Floating Debt and Bank Ways and Means	2,404
Treasury Deposit Receipts and Tax Reserve Certificates...	2,438
Total Public Borrowing at home	15,238

4. CHANGES IN THE NATIONAL PRODUCTION 1938–1945.

Owing to the complete change in the composition and direction of the country's economic effort between 1938 and 1945, it is extremely difficult to make any useful general comparison of the total volumes of effort in the two years. It is especially difficult because of the absence of information as to the relative efficiency of production in the war and non-war sectors of the economy. For these reasons, the authors of the White Paper have always refrained from giving any index numbers of real national income. Nevertheless, it is possible to make a very rough comparison of the national output of 1938 with that of 1945 by expressing the figures for both years in terms of the (national cost) prices of 1945. Table IV provides a comparison of national production in each of the years 1938, 1939, 1943, 1944 and 1945, expressed in terms of the national costs of 1945. These figures are subject to rather a wide margin of error, owing to the absence of reliable information about the extent to which the national costs of war goods and services on the one hand and capital equipment on the other have risen during the period. By expressing everything in terms of the (national cost) prices of 1945 rather than of 1938, it has been possible to reduce the importance of these margins of error to something reasonably small : if we had attempted to express the production of the later years, which was so largely concerned with war, in terms of the costs of 1938, our figures would have been almost meaningless, because of our ignorance of the extent to which the costs of war goods would need to be deflated.

---

[1] By comparison with the efficiency which would have been achieved but for the war.

TABLE IV

National Production at 1945 (National Cost) Prices.

	1938	1939	1943	1944	1945
			£ thousand millions		
Personal Consumption	5.4	5.5	4.3	4.39	4.58
Government Consumption	0.6	0.6	0.6	0.55	0.58
Non-war home capital formation	0.5	0.6	—0.3	—0.32	—0.01
Non-war overseas capital formation... ...	—0.1	—0.4	—0.7	—0.66	—0.82
Total Non-war Production	6.4	6.3	3.9	3.96	4.33
War Production	0.5	(1.0)	(4.8)	(4.66)	4.15
Total Production	6.9	(7.3)	(8.7)	(8.62)	8.48

Since war production was only a small proportion of the total in 1938–9, the effects of our ignorance on the accuracy of the total figures remains fairly small. We see, that at 1945 prices, the national income has increased by nearly one quarter between 1938 and 1945. What does this mean ? It means that, if we could transfer most of the resources engaged on war production in 1945 to peaceful production without any loss in their efficiency, we could obtain a peace-time production nearly one quarter as great again as that of 1938. In fact, however, the increase in output has been largely due to drawing into employment a number of women and old persons : it is not desirable to retain the services of all such persons in peacetime and there will be a corresponding fall in output. Nor unfortunately, is it certain that the transfer of the great quantity of resources from war to peace production could in fact be made without a considerable reduction in their contribution to the national product : this loss may appear either as a reduction in money value of their product or as an increase in the unit costs of the various peace-time products.

Whilst one need not take too seriously suggestions that the earning capacity of officers and men returning from the Armed Forces is often less than the value of their pay and allowances in kind in the Forces, there are grounds for fearing that industries, such as clothing, textiles, and the building trade, which must now expand, will be unable to pay as good wages as were earned by the men and women who must now leave the munitions industries, without having to charge higher prices.

Whatever may be the prospects in 1947 and later years, there are fairly strong reasons for expecting the 1946 national output to be well below the output (reckoned at constant prices) : for the ' output ' of the armed forces and auxiliary services will be very much smaller in 1946 than in 1945 and although the output of the rest of the community may increase a little, it is unlikely to rise nearly enough to offset the fall in the armed forces.

Whereas the armed forces and auxiliary services numbered 5.09 millions[1] in June 1945, they had fallen to 4.78 millions by September and 3.86 millions millions by December. The average for 1945 may be estimated as 4.9 millions. By February 1946 the figure was 3.12 millions and the average for 1946 may be predicted as 2.1 millions. Reckoning at £250 per head, the loss of ' output ' due to the fall of 2.8 millions may be estimated at £700 million.

The numbers employed in all other production and services fell from 16.33 million in June 1945 to 16.07 million in December 1945 and the average for 1945 may be estimated as 16.3 million. By February 1946 the number had recovered to 16.34 million, and the increase is likely to continue so as to raise the average for 1946 to about 16.8 million, which is 0.5 million higher than the 1945 average. On account of this increase we may expect an additional product of £220 million, reckoning at £440 per head. There may be a further increase due to greater output per head in industry on account of the higher proportion of males employed : but this is likely to be cancelled by the shift of employment from the war industries to peace industries and services with lower net output per head[2]: balancing these two sets of considerations we may still estimate that the product of ' industry ' (at 1945 national costs) will be £220 million higher in 1946 than in 1945.

We may now estimate the national income for 1946 (at 1945 national cost prices). Allowing for £700 million fall in the output of armed services etc., £220 million increase in that of ' industry ', the 1946 national income (at 1945 national cost prices) will be £8,000 million. The probable error of this estimate may be tentatively suggested as £250 million, although a far larger error is possible.

The 1946 national income at current national cost prices is of course likely to be larger than £8,000 million, since the continued increase in prices and wages is not likely to stop during the year. It would not be surprising if, as a result of a liberal wage policy in the bottleneck industries, the general level of factor costs was allowed to rise sufficiently to maintain the 1946 income at current (national cost) prices at the level of around £8,500 million reached in 1945. One advantage of such a policy would be that the government's revenue would be maintained despite the fall in real incomes.

---

[1] Table 4, *Statistical Digest*, April 1946.

[2] Other influences that may lower net output and incomes are a shortening of working hours and more generous allowances for depreciation and maintenance in 1946.

5. The Distribution of Income.

In Tables 14 and 20 of the White Paper figures are given which show how the national income was distributed between: (1) wages, (2) salaries, (3) rent and rates, (4) interest and profits, and (5) pay and allowances of the Armed Forces. It has often been remarked that both in this country and in others the proportion which the total of wage incomes bears to the total of all incomes has been remarkably stable from year to year. It is interesting to inquire whether the stability of this proportion has continued in spite of the severe distortions of the economic structure of the country which have taken place due to the war. The most common explanation of the stability of this proportion is that it is due to the normal practice of business firms in fixing their prices by adding a conventional percentage to their costs. If the true explanation is to be found along such lines, we should expect total wages to remain a fixed proportion not of the whole of national income but only of that part of it which is associated with the production of goods by means of employing wage-paid labour. The Armed Forces can hardly be regarded as productive in this sense, and we must therefore exclude[1] the pay and allowances to the Armed Forces from our total of national income, when we compare the total wage bill with it. Table V shows for each year 1938 to 1945 the proportion which total wages bore to the total national income excluding the pay and allowances to the Armed Forces : it will be seen that the proportion lay between 38.0 per cent and 40.0 per cent throughout the period, so that the phenomenon of the stability in this ratio apparently continued despite the disturbances due to the war.

Table V

Distribution of Income.

Wage Income as Proportion of ' National Income Excluding Service Pay '.

	1938	1939	1940	1941	1942	1943	1944	1945
Income before Tax	38.3%	38.0%	38.2%	38.6%	39.6%	40.0%	40.0%	39.2%
Income after Tax	41.3%	41.6%	42.9%	44.4%	45.5%	47.0%	47.1%	46.2%

Table V also shows the same proportions for income after taxation; there has been a large increase in labour's share of ' income after taxation ' between 1938 and 1945, and this shows that direct taxation can be and has been an effective means of redistributing money income.

The same picture of an equalizing of the distribution of ' income after taxation ' is given by the figures shown in Table VI, below, which sets out the numbers of persons with various amounts of ' income after taxation ' in each of the financial years 1938-9, 1942–3 and 1944–5. Whereas, in 1938–9 as many as 200,000 persons had incomes greater than £1,000 (the equivalent of £1,500 at 1945 prices), less than this number had incomes greater than £1,000 in 1944–5, despite the increase in prices. Whereas, in 1938-9, 19,000 persons had incomes greater than £4,000 (the equivalent of £6,000 at 1945 prices) only 60 persons had incomes greater than £6,000 in 1944–5. All these figures relate to incomes after taxation.

---

[1] Ideally one should proceed to further corrections. See Kalechi's estimates in BULLETIN, Vol. vi, 9.

TABLE VI

NUMBER OF INDIVIDUALS WITH NET INCOMES EXCEEDING VARIOUS AMOUNTS.

As assessed in 1938–39 and 1944–45.

All Incomes (after Tax) exceeding	Number of Individuals		Approximate amount of Net Income.	
	1938–39	1944–45	1938–39	1944–45
			£ million	
£150	7,000,000	13,500,000	—	—
£250	2,500,000	6,100,000	1,300	2,700
£500	680,000	1,050,000	800	920
£1,000	230,000	220,000	500	330
£2,000	75,000	34,000	290	88
£4,000	19,000	950	160	6
£6,000	7,000	60	77	less than 1
Unallocated Private Income			499	573

Whilst no doubt need be cast on the correctness of these figures there is danger of them giving a false impression unless the reader bears in mind the technical meaning of the term income, as used in this country. In the first place, income excludes any element due to increases in the prices of stock exchange securities : in particular, income excludes any benefit which may be attributed to the individual concerned due to the undistributed profits of those companies in which he has a financial interest. The existence of these profits partly accounts for the figures given for unallocated income, although these also consist of the incomes of charities and Assurance societies.

When one is considering the distribution of income between individuals, one is in danger of understating their inequality, unless one makes some attempt to allow for the imputed incomes corresponding to this unallocated income. No sufficient information is available to make any serious estimate of the precise effects of including these imputed incomes upon the inequality of the distribution of incomes after tax. But it is quite clear that their inclusion would increase the inequality very much indeed.

Purely as an illustration, it may be interesting to work out a numerical example of these effects by adopting arbitrary hypotheses about the nature of the distribution of the imputed incomes. Following Mr. Barna,[9] let us suppose that the imputed incomes due to the undistributed profits of business concerns are distributed in proportion to people's holdings of shares : let us further suppose that Barna's estimate of the way in which these shares were distributed throughout the community in 1937 remains correct for 1945. Although there has been a considerable decrease in equality of distribution of true income after payment of tax, there is no obvious reason for supposing that the inequality of the distribution of ownership of shares either increased or decreased between 1938 and 1945. In order, however, to avoid any bias

[1] Redistribution of Incomes, p. 73.

towards overstating the inequality of distribution of imputed incomes, we may suppose that the imputed incomes due to all other causes than undistributed business profits was simply in proportion to true income after taxation. Table VII shows the results of our calculation of the distribution of income after tax including imputed incomes, on the basis of all these arbitrary assumptions. An account of the details of the calculation is given in the appendix to this article.

Table VII

Distribution of Income : Allowance for Imputed Income.

Hypothethical Figures.

Income.	Number of Individuals with greater Net Income.			
	excluding imputed income.		*including* imputed income	
	1938–39	1944–45	1938–39	1944–45
£1,000	230,000	220,000	300,000	300,000
£2,000	75,000	34,000	110,000	75,000
£4,000	19,000	950	33,000	15,000
£6,000	7,000	60	15,000	5,000
£10,000	N.A.	N.A.	5,000	1,500
£20,000	N.A.	N.A.	N.A.	300
£40,000	N.A.	N.A.	N.A.	70

The apparent inequality is very greatly increased by our attempt to allow for the imputed incomes. The effect is so extreme, as to leave little doubt that however wide of the mark our arbitrary assumptions may have been some large increase of inequality must be found by including imputed incomes, whatever reasonable assumptions are made about the underlying causes of their distribution. It is, of course, impossible for private indivduals to attempt a serious estimate of the distribution of incomes including imputed incomes, but could not such an estimate be provided by the Central Statistical Office in the White Paper for 1947 ?

6. Shift to Peace-time Production.

Table VIII shows the composition of the national expenditure expressed at the 1945 (national cost) prices for each year 1938, 1944 and 1945. It will be seen that the expenditure pattern for 1945 did not differ very much from that of 1944 in spite of the end of the war in the spring of 1945. There are, however, certain signs of the switch back of economic activity to peaceful ends. For instance, there is an appreciable increase in the total production of goods for consumption : again the reduction in the negative figure for private capital investment probably reflects an increase in stocks of consumer's goods in process of production, which has offset the continued failure to make good the ordinary wear and tear and obsolescence of fixed capital equipment. At the same time, there has been a considerable reduction in the quantity of work on government account held by firms; this work was of course mainly connected with the war. Although expenditure on the war was very little less in 1945 than what it had been in 1944, it must be remembered that the figure for war expenditure in 1945 includes an item of £80 million representing the payment of deferred bonuses to released Servicemen

TABLE VIII

National Expenditure at 1945 (National Cost) Prices.

	1938	1944	1945
		£ millions	
Personal consumption of :			
Food	1,803	1,517	1,527
Alcoholic drink and Tobacco...	380	416	436
Rent, rates, water, fuel, light	607	601	580
Household	468	147	184
Clothing	764	470	477
Travel and private car	296	204	245
All other goods and services	1,092	1,030	1,133
Total Personal Consumption	5,410	4,395	4,582
Government Consumption	(610)	(560)	578
Authorities' non-war capital formation	(220)	—40	3
Repairs to war damaged buildings	—	60	120
Private net capital formation at home	(300)	—340	—128
Increase in privately held work on govt. account ...	—	—	—225
Other war expenditure	(450)	(4,660)	4,497
Total expenditure	(6,990)	(9,295)	9,427
Deduct :			
Release leave pay, war gratuities and credits to armed forces	—	—	—125
Loss of assets and increase of liabilities overseas...	(—110)	—675	—819
Total income	(6,880)	8,620	8,483

and an item of £45 million, representing the payments made to cover the first few weeks of their civilian life after release.

When one has noted these changes, one is still left with the impression that the switch to peace production is taking place very slowly, since the figures for 1945 differ in such small proportions from those for 1944. This is, of course, partly due to the fact that five of the twelve months of 1945 were war months, and that it inevitably takes months to arrange for the release of Servicemen and war workers and that it takes several further months before the products of the labour of the released men can be completed and come on to the market. In order to gain further insight into the question of how fast the change is taking place, it is necessary to supplement the figures from the White Paper with the monthly figures of employment and production given in the Central Statistical Office's monthly *Digest of Statistics.* Table IX shows the manner in which the manpower of the country was employed at each of the following dates : June 1939, June 1945 and January 1946.

This table only shows shifts of persons between industries : it throws no light on the transfer of persons within one industry such as ' Vehicles and Aircraft ' from making war goods such as aircraft to making peace goods like cars.

Since June 1945 there has been a reduction of 1.68 million in the armed forces, etc., and of 0.75 million in the ' War ' metal and chemical industries, and of 0.03 million from Government : the uses to which these 2.46 million persons have been put are summarised in Table X below.

TABLE IX

Distribution of Total Manpower.

GREAT BRITAIN.

	June 1939	June 1945	Jan. 1946
	Thousand persons		
Agriculture, Food, Drink and Tobacco*	1,502	1,510	1,516
Clothing Trades and Textiles*	1,619	1,022	1,092
Mining and Quarrying	873	799	786
Civil Engineering and Building, Building Materials, Glass, Pottery*	1,570	875	1,117
Leather, Wood and Paper Trades*	788	517	564
Non-War Metal and Chemical Industries*	406	303	326
Other non-war Manufacturing Industries*	267	218	247
Distributive Trades...	2,887	1,958	2,066
Transport, Shipping and Fishing	1,273	1,267	1,328
Gas, Water and Electricity Supply	242	196	222
Commerce, Finance, Professional, Hotels, Entertainments, etc.	2,105	1,488	1,561
Sub-total: Non-war Industries* and Services	13,532	10,153	10,825
National Government	539	994	937
Local Government	846	829	854
Sub-total: Government	1,385	1,823	1,791
Armed forces, Auxiliary Services, Civil Defence, National Fire Service, Police	557	5,219	3,543
'War' Metal and Chemical Industries*	2,595	3,963	3,209
Sub-total: War Industries and Services	3,152	9,182	6,752
Persons in manufacturing not insured	413	267	290
Unemployed including ex-members of forces	1,270	143	1,179
	19,752	21,568	20,837

* Figures for manufacturing industries only include persons insured against unemployment.
'Non-war metal and chemical industries' include tinplate manufacture, constructional engineering, construction and repair of railway carriages, wagons, etc., watches, clocks, plate, jewellery, etc., general ironfounding, heating and ventilating apparatus, and oils, greases, paints, varnish, etc.

TABLE X

	June 1945 to Jan. 1946 millions
Increased employment in 'non-war' industries and services ...	0.69
Increase in unemployed :	
Ex-service men who have not yet taken jobs	0.81
Others	0.23
Net decrease in Working Population	0.73
Total	2.46

As we have seen, the figure of 0.69 millions understates the extent of the switch from war to peace production because it only refers to the movement from predominantly warlike industries to predominantly peacetime industries. In fact most industries cater for both warlike and peaceful purposes, so that apart from the shift between industries there has been a shift from war to peace production within each industry.

This consideration particularly applies to the metal and chemical industries: Table IX showed a shift of only 23,000 into the non-war metal and chemical industries between June 1945 and January 1946: but the increase in the reported number of persons employed on orders for the Home Market and Export in the metal and chemical industries was no less than 1,220,000.

Unfortunately, the meaning and validity of these statistics of persons employed on orders for Home Market and export is extremely doubtful. It is, therefore, impossible to obtain a reliable measure of the shift from war to peace production within one particular group of industries and services.

Some light is thrown, however, by the figures of production given in Table XI. These figures do indicate that a substantially increased volume of durable consumers' goods was already finding its way to the market by February 1946.

TABLE XI

Supplies of Selected Civilian Goods. Great Britain.

	Monthly production.			
	1944	1945 3rd qr.	1945 4th qr.	1946 Jan/Feb
Passenger cars	175	773	3,708	9,813[1]
Carpets and rugs[6] (thousand sq. yds.)...	99[2]	394[3]	608[4]	746[5]
Footwear[6] (million pairs)	7.3	6.9	7.8	8.0
Electric fires[6] (thousands)	3.9	37.7	115.0	N.A.
Electric vacuum cleaners[6] (thousands)...	0.08	10.8	17.3	N.A.
Radio sets[6] (thousands)	15	9	23	46
Cycles[6] (thousands)	36.6	49.5	62.4	N.A.
Utility furniture (unit values, in thousands) ...	493	1,201	1,956	2,571
Retail sales of household goods (index of value per selling day)	87	114	146	141
Building bricks (millions)	119	97	119	154[1]

[1] 1st Qr. [2] March-November. [3] May-August [4]September-November. [5]December-February. [6]For home civilian market.

6. MAIN CONCLUSIONS.

We have seen that the payment for a large part of the war out of borrowing has to some extent impoverished the country, particularly by using up our overseas assets and by setting back the improvement of our housing and productive equipment. Although the share of income (before taxation) going as wages has remained at about 40 per cent throughout the period 1938–45 the steeper taxation has resulted in a more equal distribution of the income available after tax: but it must be remembered that the income corresponding to the undistributed profits of companies should itself be imputed to the individuals with shares in those companies: the distribution of this imputed income is very unequal and allowance for its inclusion shows that distribution is still very unequal although not so unequal as it was before the war.

The White Paper figures for 1945 indicate a National output nearly one quarter as great again as in 1938, when measured at 1945 National Cost prices. But the 1945 output was a war output compared to the peacetime output of 1938. Whether we maintain the 1945 income (at 1945 prices) must depend on whether we use our resources as fully and efficiently for peace production as for war. Already the White Paper figures show signs of the transition to peace production and more up to date information was found in the Statistical Digest: but the shift to peace production is not taking place very rapidly.

Expressed in terms of 1945 (national cost) prices, the National Income in 1946 is likely to be down to £8,000 million ± £250 million, but money wage rates are rising and 1946 national income at *current* (national cost prices) may well reach the 1945 level of about £8,500 million.

D. G. CHAMPERNOWNE.

APPENDIX I.

The Calculation of National Income at the National Cost prices of 1945.

§1. The following procedure was used to obtain the estimates shown in Tables IV and VIII. The figures in Table XII below were obtained by use of the formula:

$$f_r(t, 45) = \frac{f_r(45, 45)}{F_r(45, 38)} F_r(t, 38)$$

where for any specified group *r* of goods and services

$f_r(t, 45)$ denotes the estimated value at 1945 national cost prices of purchases in the year (1900+) t.

TABLE XII

Personal Expenditure corrected for Price Changes.

	1938	1944	1945
	£ million at 1945 national cost prices		
1. Food	1,803	1,517	1,527
2. Alcoholic Beverages: beer	186	237	247
other	93	61	62
3. Tobacco	101	118	127
4. Rent, rate and water charges...	345	351	352
5. Fuel and light	262	250	258
6. Durable household goods:			
Furniture and furnishing	275	54	76
Hardware	134	47	62
7. Other household goods	59	46	46
8. Clothing: footwear	118	85	87
other clothing	646	385	390
9. Reading matter	73	81	86
10. Privately-owned motor vehicles and their running expenses	125	7	23
11. Travel	171	197	222
12. Communication services	41	50	50
13. Entertainments	69	95	101
14. Services not included above	619	402	429
15. Other goods	275	172	183
16. Income in kind of the Armed Forces	25	200	204
17. Adjustment	—10	40	50
	5,410	4,395	4,582

and F_r (t, 38), denotes the values of the same goods at the *market* prices of of 1938.

The figures for f_r and F_r are taken from tables 10 and 9 of the White Paper.

In the case of pay and allowances for members of the forces, the increase in costs was estimated.

§2. The figures in Table XIV below were obtained from the following sources :

§3. The corrections for price changes in the sectors other than personal consumption were based on the following estimates :

TABLE XIII

Expenditure at Current National Cost

	White Paper	
	Table	*Item*
Government Consumption	4	2
Authorities' non-war net capital formation	20	9
Part of	6	6
Repairs to war damaged buildings	20	12
Private net capital formation at home	20	11
Part of	6	6
Increase in work on government account	20	10
Other war expenditure	4	3
Minus	20	10
Plus	21	23, 24
Leave pay, etc.	21	23, 24
Loss of overseas assets	20	13

TABLE XIV

Expenditure at Current National Cost.

	1938	1939	1943	1944	1945
			£ millions		
Government consumption	456	473	532	544	578
Authorities' non-war net capital formation...	119	91	–36	–36	—
Repairs to war-damaged buildings	—	—	49	56	120
Private net capital formation at home ...	165	233	–305	–335	–125
Increase in work on government account ...	—	—	25	—	–225
Other war expenditure	338	754	4,527	4,546	4,497
Leave pay, etc.	—	—	—	—	125
Loss of overseas assets	70	250	680	659	819

TABLE XV

	1938	1939	1943	1944
	Prices in terms of 1945 price (=100).			
Government consumption, non-war ...	70–80%	70–80%	95%	98%
Authorities' capital formation	50–60%	50–60%	95%	98%
Repairs to buildings	50–60%	50–60%	95%	98%
Private net capital formation	50–60%	50–60%	95%	98%
War expenditure	70–80%	70–80%	95%	98%
Overseas assets	60–70%	60–70%	95%	100%

APPENDIX II.

Method of estimating distribution of incomes, including imputed income.

§1. It was assumed that the imputed income to be added to the N'th largest income consisted of two parts :

(i) That due to undistributed profits; this was assumed to be proportional to the value of shares held by the individual concerned.

(ii) That due to other unallocated income : this was asseumed to be proportional to income *after* tax.

Accordingly, the income I′ (N) including imputed income of the individual with the N'th largest net income I (N) must be given by :

$$I'(N)=(1+A)\,I(N)+B\,F(N) \qquad (1)$$

where F (N) is the value of shares held by the individual with the N'th largest income and A and B are constants independent of N.

§2. Assuming that the inequality of distribution of shares remained constant since 1937 we may write :

$$F(N)=C_T\,X_N\,f(X_N) \qquad (2)$$

where C_T is an unknown constant independent of N for any later year T, where X_N was the size of the N'th largest income (before tax) in 1937, and where X_N f (X_N) was the average values of shares held by persons with incomes (roughly) equal to X_N in 1937.

Hence equation (1) may be written

$$I'(N)=(1+A)\,I(N)+K\,X_N\,f(X_N) \qquad (3)$$

where A and K are constants for the year in question.

§3. The total imputed income in 1938–9 and 1944–5 was taken to be equal to £499 million and £573 million, these being the amounts of unallocated income after tax. (White Paper Table 12).

The part of this due to undistributed profits was taken to be £170 million in 1938–9 and £210 million in 1944–5, these being the amounts of non-personal savings (White Paper Table 21, Item 43). By subtraction, the remaining imputed income was £329 million in 1938–9 and £363 million in 1944–5.

Mr. Barna has estimated that the total value of shares in 1937 was £6,512 million.[1] hence in 1938–9 $6512\,K=170$
and in 1945 $6512\,K=210$.

Thus the values of K were
0.026 in 1938–9 and 0.032 in 1944–5.

Similarly, since the total of personal incomes after tax was £4,129 million in 1938–9 and £6,478 million in 1944–45 (White Paper Table 12), we have

$4129\,A=329$ in 1938–9
$6478\,A=363$ in 1944–5.

So that the values of A were
0.080 in 1938–9 and 0.056 in 1944–5.

§4. The values of X_N were obtained by plotting a graph of X_N against N from the data given in Table 13 of Barna's ' Redistribution of Incomes '. Similarly, the values of f (X_N) were obtained by plotting a graph[2] of f (X_N)

against X_N from the data given in Tables 17 and 77 of ' Redistribution of Incomes '.

Finally, the values of I (N) in each year 1938–9 and 1944–5 were found by plotting graphs[2] (from the figures of Table 13 of the White Paper) showing the numbers N of net incomes exceeding various amounts I.

§5. Having evaluated A and B for each year 1938–39 and 1944–5, it was possible by reading from the various graphs to plot for each of the two years a new graph[2] showing

$$I'(N)=(1+A)\,I(N)+K\,X_N\,f(X_N) \qquad (3)$$

the size of the N'th largest ' net income including imputed income '. From this graph were obtained the figures given in Table VII above.

---

[1] Barna : Redistribution of Income Table 77.

[2] These graphs were plotted on logarithmic paper for reasons of convenience.

EARNINGS, HOURS, AND MOBILITY OF LABOUR.

The first part of this article contains a summary of the changes in earnings and hours of labour between 1938 and 1945, and a discussion of the different factors responsible for these changes. The second part contains a study of wages in relation to war-time changes in the man-power of different industries.

I. Earnings and Hours of Labour, 1938 to 1945.

Earnings enquiries have been conducted by the Ministry of Labour at six-monthly intervals since July 1941, and in October 1938 and July 1940. These enquiries cover the main industries engaged in mining (except coal mining), manufacturing, building and public utilities, which will be referred to as the Principal Industries. They do not include agriculture, coal mining, railways, the shipping service, port transport, the distributive trades, catering, or domestic and other services. Information is available, however, about the earnings of coal miners and railway workers since before the war, as well as of dock labourers since 1942. Data on working hours were collected in October 1938, July 1943, and in subsequent enquiries, but not at the intermediate dates.

The average weekly wages of men, boys (under 21), women, girls (under 18) and of all workers together, in the industries covered by the Ministry of Labour enquiries, are shown below, for the three dates: October 1938, July 1944, when the peak level was reached, and July 1945. These averages were obtained by weighting the different industries according to the numbers currently employed at the respective dates. It should be remembered that the figures relate to actual *earnings* in a given week, including any extra payments for overtime, Sunday or night work, as well as earnings on piece work, and must be distinguished from *wage rates*, which are based on a full ordinary week's work and do not include any of these additional payments.

Table I.

AVERAGE WEEKLY EARNINGS IN THE PRINCIPAL INDUSTRIES.

	Men	*Boys*	*Women*	*Girls*	*All*
	s. d.	s. d.	s. d.	s. d.	s. d.
October 1938 ...	69 0	26 1	32 6	18 6	53 3
July 1944 ...	124 4	47 4	64 3	34 11	96 8
July 1945 ...	121 4	45 6	63 2	35 1	96 1

Part-time women workers (those employed for not more than 30 hours a week), whose average weekly earnings in July 1945 were 31s. 4d., are included, throughout this survey, on the basis of two part-time workers representing one full-time worker.

Index numbers of average earnings, for all the dates at which enquiries have been held since October 1938, are shown in Table II. The first set of figures was obtained by applying weights proportionate to the numbers in the different industries, and in the four sex and age groups, in 1938. The figures in the second part of the table are based on the numbers currently employed at the respective dates, the index number for a particular date representing the ratio of the average earnings prevailing at that date to the average earnings in October 1938.

For the sake of comparison, the Ministry of Labour index of wage rates in the same group of industries is also shown. If this index were extended to include the main industries not covered by the enquiries, namely agriculture, coal mining, railways and merchant shipping, it is stated that the figure for July 1945 would be raised to 151.

Average earnings in January in the building and contracting industries are affected by the fact that working hours are shorter in winter than in summer. In order that the January figures should be more closely comparable with those at other dates, the index numbers were adjusted by assuming that average earnings of builders at each of the January enquiries were mid-way between the averages recorded at the July enquiries of the same and the preceding year; the unadjusted and adjusted figures have both been shown.

Table II

INDEX NUMBERS OF AVERAGE EARNINGS IN THE PRINCIPAL INDUSTRIES.

Based on numbers employed in 1938.

	Men	*Boys*	*Women*	*Girls*	*All*	*Index of Wage rates*
October 1938	100	100	100	100	100	100
July 1940	126	132½	118	118	125	110½
July 1941	140	155½	129	132½	139½	118
January 1942 (unadjusted)	140½	156½	134½	140	140½	122
January 1942 (bldrs. adj.)	144	161½	—	—	144	—
July 1942	153	169	151	159	154	124
January 1943 (unadjusted)	154	165	158½	166	155½	126½
January 1943 (bldrs. adj.)	156	168	160	—	157½	—
July 1943	164	173	167	176	165	130
January 1944 (unadjusted)	165	172	170½	178½	166½	132
January 1944 (bldrs. adj.)	166½	173½	171	—	167½	—
July 1944	169	175	174	183	170½	135½
January 1945 (unadjusted)	164	165	173	178	165½	138½
January 1945 (bldrs. adj.)	165	166	174	—	166½	—
July 1945	169½	172	180	187½	171½	143

Based on numbers currently employed.

	Men	*Boys*	*Women*	*Girls*	*All*
October 1938	100	100	100	100	100
July 1940	129.0	134.5	119.7	120.7	129.9
July 1941	144.1	160.7	135.1	135.1	142.4
January 1942 (unadjusted)	147.8	162.9	146.2	145.0	146.0
January 1942 (bldrs. adj.)	151.0	167.6	—	—	150.2
July 1942	161.5	177.0	166.7	163.5	159.9
January 1943 (unadjusted)	164.9	172.8	180.0	173.4	165.1
January 1943 (bldrs. adj.)	167.0	176.0	181.8	—	167.6
July 1943	175.7	180.8	191.3	182.9	175.7
January 1944 (unadjusted)	179.2	179.6	196.2	185.1	179.5
January 1944 (bldrs. adj.)	180.6	181.0	196.7	—	181.2
July 1944	180.2	181.5	197.7	188.7	181.5
January 1945 (unadjusted)	172.8	169.0	194.3	182.0	176.0
January 1945 (bldrs. adj.)	174.0	170.4	195.1	—	177.4
July 1945	175.8	174.4	194.4	189.6	180.4

From the second set of figures, it is evident that, except for girls, average earnings reached their peak in July 1944. Over the period from 1938 to 1945, the average earnings of women and girls are seen to have risen more than those of men and boys. This is partly because, during the war, women have frequently taken over work which was formerly done by men, so that the proportionate numbers of women employed in different occupations within a given industry have probably changed considerably. The same may also be true of boys, whose average earnings, in the first few years of the war, increased faster than those of men, although the average age of boys in employment must have fallen, those in the older age groups being liable to conscription.

Comparison of the two sets of figures shown in Table II shows the effects on average earnings of transferences from relatively low paid to relatively high paid industries, as well as, in the case of the averages for all workers, the effects of changes in the relative proportions of men, boys, women and girls.[1] In the industries covered by the enquiries, the percentage numbers in these four sex and age groups, in October 1938, and in January and July 1945, were approximately as follows :

	Percentage Numbers Employed.			
	Men	*Boys*	*Women*	*Girls*
October 1938	61½	12	19½	6¾
January 1945	60	8½	27	4½
July 1945	61	8¼	26½	4¼

The proportion of women employed in these industries has increased and the proportions of boys and girls have declined; the proportion of men, on the other hand, has remained surprisingly stable.

With the help of these figures, we can separate the effects, on the average earnings of all workers, of relative changes in sex and age groups from those of transferences between different industries. The results are given in Table III.

The fact that the proportion of women increased during the war, while the proportion of men declined, caused a reduction in the average earnings of all workers combined, which was only partly counterbalanced by the fall in the proportions of boys and girls. At the last two dates, however, the net effect of changes in the proportions in these four groups, partly because the proportion of men began to increase and that of women to decline, has been to raise the general level of earnings.[2]

The effects of changes between industries on the average earnings of men and women apparently reached a maximum in January 1944, since when the

---

[1] Writing N_0 and N_1 for the relative numbers ($\Sigma N_0 = \Sigma N_1 = 1$) and W_0 and W_1 for wages at the two dates, the formulae are respectively :

$$\frac{\Sigma N_0 W_1}{\Sigma N_0 W_0} \quad \text{and} \quad \frac{\Sigma N_1 W_1}{\Sigma N_0 W_0}$$

The ratio of the latter to the former is $1 + \Sigma(N_1 - N_0)\ W_1$ which depends on the correlation between changes in numbers and the level of earnings at the later date.

[2] The contrary statement, which appears in *The Ministry of Labour Gazette* for February 1946, is not borne out by the results of our calculations.

movement has been reversed in the direction of industries where wages are relatively low. The effects of such transferences have been greatest in the case of women, mainly, no doubt, because new entrants have been attracted to the more highly paid industries, and least in the cases of boys and girls.

TABLE III.

EFFECTS OF DIFFERENT FACTORS ON AVERAGE EARNINGS IN THE PRINCIPAL INDUSTRIES.

	Changes between Industries.					*Changes in Sex-age Groups*	*All Workers*	
	Men	*Boys*	*Women*	*Girls*	*All*		*Hours*	*Misc. Factors*
	Percentage Increase or Decrease (—) in Earnings.							
July 1940	2½	1½	1½	2½	2¼	+1.5	13.4	
July 1941	3	3½	4½	2	3	—0.9	18.1	
Jan. 1942	5	4	8½	3½	5½	—1.6	18.6	
July 1942	5½	4½	10½	3	6	—1.9	24.0	
Jan. 1943	7	5	13½	4½	7½	—1.3	24.7	
July 1943	7	4½	14½	4	7¾*	—1.3	7.0	18.8
Jan. 1944	8½	4½	15	3½	9†	—1.0	5.9	20.1
July 1944	6½	3½	13½	3	7¼‡	—0.5	4.5	20.6
Jan. 1945	5½	2½	12½	2	6‡	+0.4	1.7	18.4
July 1945	3½	1	8	1	4‡	+1.2	1.9	17.6

*Of which 0.5 per cent was due to differences in hours.
†Of which 0.9 per cent was due to differences in hours.
‡Entirely due to differences in earnings.

Average hours of work in the principal industries in October 1938, and the percentage changes since that date, are shown in Table IV. The figures relate to the average number of hours actually worked and exclude, for instance, recognised intervals for meals. This information is not available for any date between October 1938 and July 1943, but it is known that in some cases working hours were reduced before the latter date. The effect of the seasonal factor in the building and contracting industries has again been eliminated, so far as possible, by recalculating the percentages on the assumption that average hours in building, at each of the January enquiries, were mid-way between the averages at the two adjoining dates. The percentage changes in the average hours of all workers are shown, weighted according to the relative numbers in different industries, and in different age and sex groups, in 1938, and also according to the relative numbers currently employed. From July 1944 onwards, the difference between the results obtained from the two methods of weighting was negligible.

TABLE IV.

AVERAGE WEEKLY HOURS OF WORK IN THE PRINCIPAL INDUSTRIES.

	Men	*Youths*	*Women*	*Girls*	*All*	*All 1938 Wts.*
		Current Weights				
October 1938	47.7	46.2	43.5	44.6	46.5	—
	Percentage Increase or Decrease (—) since October 1938					
July 1943	10.9	3.9	5.5	1.1	7.5	7.0
Jan. 1944 (unadjusted)	9.0	1.9	3.9	0	5.8	4.8
Jan. 1944 (bldrs. adj.)	10.1	2.6	4.6	—	6.8	5.9
July 1944	7.3	1.1	2.5	—0.9	4.5	—
Jan. 1945 (unadjusted)	3.6	—2.2	—0.9	—3.6	1.1	—
Jan. 1945 (bldrs. adj.)	4.4	—1.7	—0.7	—	1.7	—
July 1945	4.2	—1.3	—0.5	—2.5	1.9	—

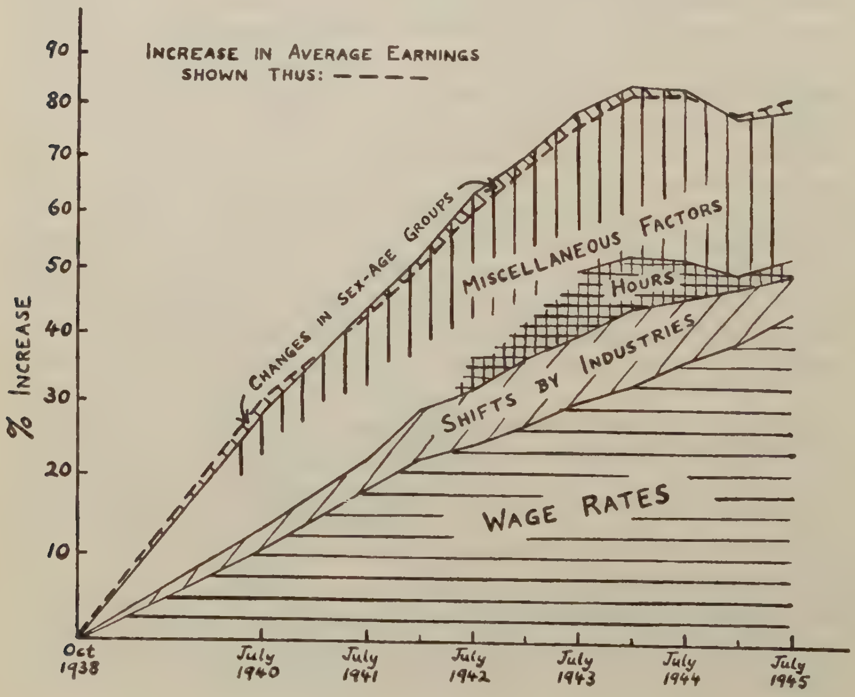
Of the various factors which have been responsible for the increase in the average earnings of all workers in the principal industries, it has thus been possible to obtain separate estimates for the following, the percentage changes between October 1938 and January 1944 being shown for the sake of illustration :

Effect on Average Earnings of :	*Changes between October 1938 and January 1944*
(i) Wage rates	+32%
(ii) Changes in numbers employed in different industries :	
(*a*) owing to differences in hours	+0.9%
(*b*) owing to differences in earnings	+8%
(iii) Changes in hours of work in given industries	+5.9%
(iv) Changes in relative numbers of men, women, boys and girls	—1.0%
(v) All remaining factors, including extra payments for overtime and night work, changes between different occupations within each industry and changes in age structure within the four sex and age groups (estimated as a residual)	+20.1%

Index of average earnings of all workers (October 1938 = 100) :
132 × 1.009 × 1.08 × 1.059 × .99 × 1.201 = 181.2 (approx.).

The estimated effects of each of these factors, for all dates for which the relevant information is available, are shown in Table III. The relative importance of the different factors on the average earnings of all workers is also shown, in pictorial form, in Diagram A. The logarithmic scale has here

DIAGRAM A.—ANALYSIS OF INCREASE IN EARNINGS



been used, so that equal vertical distances represent equal percentage changes. The width of any band corresponds to the relative strength of the particular factor and the vertical summation of all the bands (allowing for the effect of changes in sex and age groups being negative over a large part of the period) represents the increase in average earnings. Before July 1943, it is not possible to separate the effect of increases in hours from that of miscellaneous factors.

It can be seen that, while wage rates have shown a steady increase, at an average rate of about 5½ per cent per annum, the influence of transferences between different industries began to fall during 1944, hours have been reduced almost to their pre-war level, and the effects of residual factors has also begun to decline. As industries return to more normal conditions, and overtime working, for example, becomes less common, some of these tendencies can be expected to continue beyond July 1945. The effects of changes in the relative importance of different industries would, however, remain if a wage policy were adopted which was designed to attract labour into the expanding industries. The increase in wage rates will probably continue, but the declining importance of other factors can be seen from the fact that in January 1944, when earnings had reached a peak level, changes in all factors other than wage rates were responsible for raising the average level of earnings by as much as 37 per cent, while in July 1945 they were responsible for raising the average level by about 26 per cent.

Table V contains information about weekly and hourly earnings of men (21 and over) and women (18 and over) in the sixteen groups of industries covered by the Ministry of Labour enquiries. Up to July 1943, the greatest increases in men's earnings were in engineering, miscellaneous manufacturing industries and government industrial establishments; the smallest increases were in paper and printing, which had relatively high earnings in 1938, and in transport, building and public utilities. Since then, weekly earnings of men in government establishments have fallen, owing to a reduction in hours, while textile workers and brick makers, whose earnings were relatively low in 1938, have experienced some improvement.

When the different groups of industries are arranged in order, according to the level of men's hourly earnings, their relative positions show comparatively little change. The relative positions of men engaged in the treatment of non-metalliferous mine and quarry products, in the brick, pottery and glass industries, and in miscellaneous manufacturing, have improved, while the relative positions of builders and transport workers have declined, but the positions of the remaining eleven groups have shown little or no change.

The order of the different groups of industries, when arranged according to the level of women's hourly earnings, shows greater changes. Women engaged on non-metalliferous products, in engineering and in miscellaneous manufacturing industries have improved their relative positions, while the relative positions of those engaged in the leather, clothing and paper industries, and in public utility services, have declined.

TABLE V. AVERAGE WEEKLY AND HOURLY EARNINGS IN THE PRINCIPAL INDUSTRIES.

AVERAGE WEEKLY EARNINGS.

	MEN							WOMEN						
	Oct. 1938		July 1945		July 1941	July 1943	July 1945	Oct. 1938		July 1945		1941	1943	1945
	s.	d.	s.	d.	Index numbers (Oct. 1938=100)			s.	d.	s.	d.	Index Nos. (Oct.1938=100)		
Mining, quarrying of iron, stone, etc. ...	60	0	103	6	139	163	173	—		—		—	—	—
Treatment of non-met. products... ...	66	5	116	5	142	165	175	29	8	62	11	151	199	212
Brick, pottery, glass	63	2	111	1	140	165	176	27	10	51	9	139	177	186
Chemical, paint, oil, etc.	69	3	122	10	142	168	177	32	8	62	10	138	195	192
Motor Engineering, shipbuilding ...	75	0	133	0	150	184	177	33	4	69	1	144	210	207
Textiles	57	3	104	7	142	169	183	31	9	58	2	132	167	183
Leather, fur, etc.	64	1	107	6	134	156	168	34	11	54	6	115	146	156
Clothing	64	3	110	8	130	154	172	32	9	55	7	126	153	170
Food, drink, tobacco	65	3	110	4	134	156	169	32	11	56	7	122	154	172
Woodworking	66	3	110	7	131	154	167	33	8	62	4	127	169	185
Paper, printing, etc.	84	3	122	11	115	134	146	34	1	54	7	116	150	160
Building, contracting, etc.	66	0	111	4	147	164	169	—		60	5	—	—	—
Miscellaneous manufacturing	69	1	126	6	144	178	183	31	9	63	7	135	187	200
Transport, storage, etc.	70	0	114	10	132	149	164	34	11	81	7	170	205	234
Public Utility Services	63	1	98	6	123	140	156	27	8	51	5	135	173	186
Government industrial	75	3	127	1	147	176	169	44	9	80	11	121	181	181
All the above	69	0	121	4	144	176	176	32	6	63	2	135	191	194

AVERAGE HOURLY EARNINGS.

	MEN								WOMEN								
	Oct. 1938		July 1943		July 1945		1943	1945	Oct. 1938		July 1943		July 1945		Oct.1938	Jy. 1943	Jy. 1945
	d.	order	d.	order	d.	order	Index Numbers (Oct. 1938=100)		d.	order	d.	order	d.	order	% of Men's hourly earnings.		
Mining, quarrying of iron, stone	15.6	13=	23.9	13	25.9	13=	153	165	—		—		—		—	—	—
Treatment of non-met. products	16.0	11	25.2	6	27.3	8	158	171	7.8	13=	15.8	5=	17.1	7=	45.8	62.7	62.6
Brick, pottery, glass	15.6	13=	24.6	8=	26.9	9	158	173	7.8	13=	13.3	15	14.3	15	50.0	54.1	53.2
Chemical, paint, oil, etc.	17.2	4=	26.6	5	28.6	6	155	166	8.9	9	17.1	4	17.1	7=	51.7	64.3	59.8
Motor engineering, shipbuilding	18.7	2	30.7	1	32.4	1	164	173	9.1	6=	17.9	3	19.1	3	48.7	58.3	59.0
Textiles	14.4	16	22.6	15	25.0	15	157	174	8.6	10=	13.6	12=	15.6	11	59.7	60.2	62.4
Leather, fur, etc.	16.2	10	24.2	11	26.4	12	149	163	9.1	6=	13.6	12=	15.3	13	56.2	56.2	58.0
Clothing	17.2	4=	25.1	7	28.7	5	146	167	9.6	3	13.7	10=	15.8	10	55.8	54.6	55.1
Food, drink, tobacco	15.9	12	23.5	14	25.9	13=	148	163	8.6	10=	13.4	14	15.5	12	54.1	57.0	59.8
Woodworking	17.0	8	24.6	8=	27.6	7	145	163	9.1	6=	15.4	8	17.7	5	53.5	62.6	64.1
Paper, printing, etc.	22.0	1	27.9	3=	30.5	3	127	139	9.2	4=	13.7	10=	15.1	14	41.8	49.1	49.5
Building, contracting, etc. ...	17.1	7	24.3	10	26.6	11	142	155	—		15.8	5=	17.3	6	—	65.0	65.0
Miscellaneous manufacturing ...	17.0	8=	27.9	3=	30.6	2	164	179	8.6	10=	15.5	7	17.8	4	50.6	55.6	58.2
Transport, storage, etc.	17.2	4=	24.1	12	26.7	10	140	155	9.2	4=	18.5	2	21.4	2	53.5	76.8	80.1
Public Utility Services	15.4	15	21.1	16	23.9	16	137	155	10.1	2	13.8	9	15.9	9	65.6	65.4	66.5
Government Industrial	18.2	3	28.8	2	30.4	4	158	167	12.0	1	21.3	1	22.9	1	65.9	74.0	75.3
All the above	17.4		27.5		29.3		158	169	9.0		16.3		17.5		51.7	59.3	59.7

In nearly all groups of industries, the percentage of women's to men's hourly earnings is seen to have risen. For all the industries combined, this percentage has risen from about 52 in October 1938 to about 60 in July 1945. This is partly explained by the fact that women have been taking over work which was formerly done by men (cf. above, p 148).

Apart from the industries which are included in the Ministry of Labour enquiries, the only data on earnings which are available relate to coal miners and railway and dock workers. The data on coal miners' wages, which are summarised in Table VI, cover all classes of workers, including juveniles, and the averages for 1938 to 1944 refer to the whole of each year, not to sample weeks, as in the Ministry of Labour enquiries.

TABLE VI.

AVERAGE WAGES IN COAL MINING IN GREAT BRITAIN.*

	Av. Earnings per Man-shift.		*Index of av. earnings per Man-shift*	*Average weekly earnings.*		*Index of average weekly earnings.*
	s.	d.		s.	d.	
1938	11	8.02	100	57	11	100
1939	11	11.99	102.8	61	9	106.6
1940	13	6.05	115.7	71	2	122.9
1941	15	5.11	132.2	82	9	142.8
1942	18	0.18	154.4	96	2	166.0
1943	19	8.54	168.9	103	3	178.3
1944	22	4.75	191.9	113	0	195.0
1945† (1st half) ...	23	9	203.6	118	5	204.5
(3rd qr.)	24	6	210.0	110	10	191.4

*All the figures include the value of allowances in kind.

†Provisional.

During the war, average weekly earnings of coal miners have risen more than those of most other workers, so that, whereas in 1938 the average weekly earnings of miners were less than those of any of the groups, with the exception of textiles, shown in Table V, by 1945 they were not far below the average level of men's earnings in these other industries.

The average earnings of railway workers, at all the recent dates for which information is available, are shown in Table VII, the figures in each case relating to one week in March. In calculating the averages, all workers receiving adult rates of pay were classified as men or women, and those paid at junior rates were classified as boys or girls. This, and the effects of recruitment to the forces, must have caused a lowering of the average age of boys classified as such and would thus provide a partial explanation for the increase in boys' earnings being less than the increase in men's earnings.

TABLE VII.

AVERAGE WEEKLY EARNINGS IN THE RAILWAY SERVICE.

	Men		*Boys*		*Women*		*Girls*		*Men*	*Boys*
	s.	d.	s.	d.	s.	d.	s.	d.	Index numbers (Mar. 1939=100)	
March 1939	68	9	28	10	—		—		100	100
March 1942	96	2	35	10	63	1	40	2	140	124
March 1943	105	4	38	6	74	2	47	5	153	133½
March 1944	114	0	40	4	79	8	50	2	166	140
March 1945	116	10	42	3	82	8	48	8	170	147

The average weekly earnings of women railway workers were 66 per cent of men's average earnings in March 1939 and 71 per cent in March 1945, a much higher proportion than in most other industries. The corresponding figures for all the industries included in the Ministry of Labour enquiries were 47 per cent in October 1938, and 52 per cent in July 1945.

The average weekly earnings of all classes of dock labourers, during three months of each year from 1942 to 1945, were as follows:

	s.	d.
July-September 1942	127	6
„ „ 1943	153	10
„ „ 1944	161	8
„ „ 1945	136	7

The averages recorded for the last three years compare favourably with the average earnings of engineers (cf. Table V). No comparable figures are available for any pre-war date.

To complete this survey, a rough estimate may be made of the average increase in earnings for the industries included in the Ministry of Labour enquiries, combined with agriculture, coal mining and railways. For agriculture, figures of earnings are not available, but Professor Bowley's index of wage *rates* shows an increase of 103 per cent between 1938 and July 1945. The average wage *rate* of dock labourers in 1938 was 72s. 10½d.,[1] and, assuming that at that time there were no extra payments, the increase in average earnings of dockers from 1938 to the third quarter of 1945 would be 87½ per cent. For coal mining, railways (men and boys) and the other industries, we use the figures quoted above.

The average earnings of all workers in these industries, when weighted by the relative numbers employed in 1938, are estimated to have risen by about 75 per cent between 1938 and July 1945, and by about 83 per cent over the same period when weighted by the relative numbers currently employed at the respective dates. These estimates do not include distribution, domestic service and certain other industries, in which the increase in earnings has probably been less. But assuming that the estimated increase in earnings is representative of all wage earners, and using the data contained in the latest White Paper on the National Income (Cmd. 6784) concerning the change in the level of retail prices, and the proportion of wages taken by income tax and compulsory insurance contributions, we obtain the following estimates of changes in money and real wages, before and after direct taxation.

	Percentage change 1938 to 1945.
Average money wages, before taxation	+83%
Average real wages, before taxation	+19%
Average money wages, after direct taxation	+69%
Average real wages, after direct taxation	+10%

There has apparently been some increase, therefore, in average real wages, after allowing for direct taxation, during the war; these estimates do not, of course, take account of the effects of rationing in reducing the consumer's freedom of choice.

[1] As shown by Professor Bowley's Index of Wage Rates.

II. Wages and the Mobility of Labour.

We propose, in this section, to consider the relationship between wages and war-time changes in the labour force of different industries. Our general aim is to try to ascertain, by the methods of multiple correlation, to what extent the movements of labour from one industry to another have been connected with relative wage-levels. These movements are, of course, influenced by many other factors, among which are the conditions of work and the supply of labour with the requisite skill. During the war, movements of labour have also been affected by a large number of special factors, including the concentration of non-essential industries, the enlistment of men into the armed forces, and various measures of direct control; it was not, however, until a comparatively late stage, when considerable movements had already taken place, that measures were introduced for the control of industrial labour. The relative numbers of men in different industries must also have been affected by the extent to which women have been employed in place of men; but on the whole (see p. 148) there does not appear to have been much substitution of this kind. Although relative earnings may not, in themselves, have had an important influence, they may at least have played a part in facilitating the transferences of labour which concentration on the war effort demanded.

The results of the present analysis must be interpreted with caution and the special circumstances of the war should be borne in mind. It may, nevertheless, be suggested that the broad conclusions have some general significance, at any rate for periods of rising employment. It is not, however, to be expected that similar results would be obtained under different conditions; and it is very unlikely that the numerical value of a particular parameter would remain unchanged.

The analysis is confined to men aged 21 to 64 and to the period between July 1938 and July 1943,[1] since the number of men employed in munitions industries reached its peak at about the latter date.[2] The variables included in the correlation are as follows :

x_1 = percentage change between July 1938 and July 1943 in the number of men (21—64) insured against unemployment.
x_2 = percentage increase in hourly earnings of men between October 1938 and July 1943.
x_3 = hourly earnings (in pence) of men in October 1938.
x_4 = percentage increase in hours of work of men between October 1938 and July 1943.

These variables will sometimes be referred to by the numbers here used as sub-scripts. Regarding x_1 as the dependent variable and x_2, x_3, and x_4 as independent variables, and measuring from the averages in each case, an equation was sought of the form :

$x_1 = b_{12.34}x_2 + b_{13.24}x_3 + b_{14.23}x_4$ in terms of the units indicated above,

or $x_1 = \beta_{12.34}x_2 + \beta_{13.24}x_3 + \beta_{14.23}x_4$ in terms of normalised units.

$(b_{12.34} = \beta_{12.34}\frac{\sigma_1}{\sigma_2}$, etc.).

---

[1] The data on earnings and hours relate to October 1938 and July 1943.

[2] Cf. Sir Godfrey Ince, Mobilization of Man-Power in Great Britain for the Second Great War, Table 7. Manchester School, 1945–6

It was necessary to include hourly earnings, rather than wage rates, since there is insufficient information about the latter. The reason for including the increase in hours of work as a fourth variable was that increases in hourly earnings would be partly explained by overtime working and this might be the result of a shortage of labour, which in turn might also be reflected in the changes in the numbers insured. Thus a meaningless correlation might arise between x_1 and x_2; the variable x_4 is included in order to eliminate this effect.

By including changes in hours, we might not, indeed, have succeeded in completely eliminating this influence, since, in conditions of labour shortage, the hourly earnings of men working on piece rates would be raised if their speed of work were increased. It would be expected, however, that if there were any connection, of the kind referred to, between x_1 and x_2, it would be at least partly reflected in the regression co-efficient of x_4, as well as in the partial correlation co-efficients.

The data for these four variables are available for about 90 industries which are separately classified in the Ministry of Labour returns. The earnings enquiries of the Ministry of Labour do not cover agriculture, coal mining or railways, but some information is obtainable about earnings, and rough estimates can be made of changes in hours, in these three industries. Since they included a substantial proportion, about 20 per cent, of the numbers insured in 1938, it seemed better to include them in the correlation, even though the figures for these industries may not be very reliable, rather than limit the field to those industries which are covered by the regular earnings enquiries. But, in order to find out whether this decision had any effect on the final results, alternative calculations were made, the first including and the second excluding the three industries mentioned.

Results of Correlation Analysis, including Agriculture, Coal Mining and Railways.

The number of industries included in this analysis was 88. Each of the four variables was weighted by the number of men insured in the different industries in July 1938. The values obtained for the complete set of zero-order and first and second order correlation co-efficients are listed below.

TABLE VIII

CORRELATION COEFFICIENTS.

$r_{12}=.4393$	$r_{12.3}=.8016$	$r_{12.4}=.4383$	$r_{12.34}=.8755$
$r_{13}=.2660$	$r_{13.2}=.7784$	$r_{13.4}=.2412$	$r_{13.24}=.8302$
$r_{14}=.2135$	$r_{14.2}=.1959$	$r_{14.3}=.1754$	$-r_{14.23}=.0686$
$-r_{23}=.4864$	$-r_{23.1}=.8042$	$-r_{23.4}=.5514$	$-r_{23.14}=.8801$
$r_{24}=.1325$	$r_{24.1}=.0503$	$r_{24.3}=.3295$	$r_{24.13}=.4042$
$r_{34}=.2197$	$r_{34.1}=.1836$	$r_{34.2}=.3788$	$r_{34.12}=.5217$

The first two lines of this table show that there is a strong correlation between the increase in numbers (x_1) and the increase in hourly earnings (x_2), as well as between the increase in numbers and the level of hourly earnings prevailing in 1938 (x_3), though the latter association is not quite as strong as the former. The partial (or net) correlation coefficients $r_{12.3}$ and $r_{13.2}$ are substantially higher than the zero-order coefficients r_{12} and r_{13}, and the complete set of 4 variables yields higher correlation coefficients between x_1 and x_2, and between x_1 and x_3, than any of the sub-sets. Thus the correlations become stronger when the influence of the other factors is eliminated. The net correlation coefficient between changes in numbers and changes in hourly earnings, after eliminating the influence of the other two factors, is as high as 0.88; that between changes in numbers and the level of hourly earnings in 1938, after eliminating connections with the other two variables, is 0.83.

Since the net correlation coefficients are not reduced by the introduction of x_4, it appears that the influence of changes in hours must be relatively small, as shown also by the low values of the correlation coefficients between x_4 and each of the other three variables; in fact, the correlation between x_1 and x_4 is too small to be considered significant. That the increase in hours should be more strongly correlated with the level of earnings in 1938 than with changes in hourly earnings is presumably fortuitous. The negative correlation between x_2 and x_3 indicates that, in general, hourly earnings have risen most in industries where they were lowest in 1938.

We must consider, next, the problem of estimating the regression equation expressing x_1 as an explicit function of some or all of the three independent variables. The result will depend not only on which variables are included, but also on the assumptions that are made regarding the ‘ errors ’ attaching to each of them. In order to show the effects of different assumptions, we have estimated the various possible sets of regression coefficients, obtained by minimising the sums of the squares of deviations in the direction of each of the four variables. Following Professor Frisch,[1] the results of working with different assumptions, and different selections of the independent variables, can then be conveniently assembled in the form of so-called bunch-maps.

If each variable is expressed in normalised units (i.e. in units of the standard deviation) the value obtained for the regression coefficients in the complete set of four variables are given in the following table. The errors are minimised in the direction of the variable indicated at the head of each column.

TABLE IX.

NORMALISED REGRESSION COEFFICIENTS.

β	*Errors minimized in direction of :*			
	x_1	x_2	x_3	x_4
12.34	+.7532	+1.7067	+1.3628	+7.5756
13.24	+.6382	+1.1547	+1.7999	+8.7359
14.23	—.0265	—0.2663	—0.3624	—21.7833

---

[1] R. Frisch, *Confluence Analysis by means of Complete Regression Systems* (1934).

These normalised regression coefficients, and others obtained from different sub-sets of the four variables, are represented by the bunch-maps in Diagram 1. The lines, or beams as they are called, in any one square indicate the slope of the regression coefficient referred to by the numbers shown in brackets at the top of the square. The number attached to each beam indicates the variable in which errors are assumed to be concentrated. The so-called leading beams, marked by circles, refer to the two variables, the connection between which is measured by the particular regression coefficient. All the coefficients refer to regression equations in which x_1 is expressed as an explicit function of the other variable(s). Each regression coefficient can be obtained as the ratio of two co-factors of a correlation determinant and the values of these co-factors determine the length of the beam. Negative regression coefficients are represented by beams sloping downwards to the right.

A variable is considered useful if it satisfies some or all of the following criteria: (i) the beams become closer, (ii) the slopes of the beams change, (iii) the beam representing the regression coefficient obtained when errors are minimised in the direction of the new variable lies between the others. If the opposite conditions prevail, or if the beams move further apart without changing direction, the variable is said to be detrimental. It is considered superfluous if, according to these criteria, there is very little change, or if the new beam is much shorter than the others, and the latter do *not* become any shorter.[1]

Looking down the four squares on the left side of the diagram, which show the connection between x_1 and x_2, we can see the effects of introducing the other two variables. When x_3 is introduced the beams become closer, indicating that this is a useful variable. The set (12.4) shows that the introduction of x_4 has little effect on the position of the other beams, while the complete set (12.34) shows a barely perceptible improvement on the set (12.3).

Looking, next, at the middle set of four squares, relating to the connection between x_1 and x_3, we see that x_2 is definitely useful, but the further introduction of x_4 produces only a very slight improvement.

In all the last four squares on the right, the leading beams are seen to be almost at right angles; this reflects the low correlation, already noticed (see Table VIII), between x_1 and x_4. The sets (14.2) and (14.3) show practically no improvement on (14). Since the beams change direction, and become shorter but not any closer, in the set (14.23) it may be concluded that the combination of the variables x_2 and x_3 contributes some, though very little, information about the connection between x_1 and x_4. The regression coefficients in this set are numerically very small, except when errors are minimised in the direction of x_4 (cf. Table IX), and negative, which indicates that increases in hours, when connections with the two variables relating to

---

[1] For a fuller explanation of bunch-maps, their method of construction and interpretation, the reader may refer to R. Frisch, op. cit., or to J. Tinbergen, *Statistical Testing of Business-Cycle Theories* (1939).

DIAGRAM 1

NORMALISED REGRESSION SLOPES. ALL MAIN INDUSTRIES

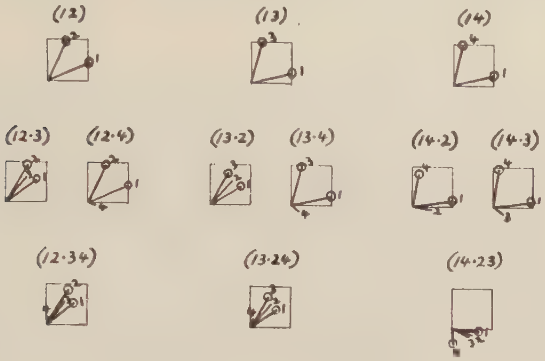
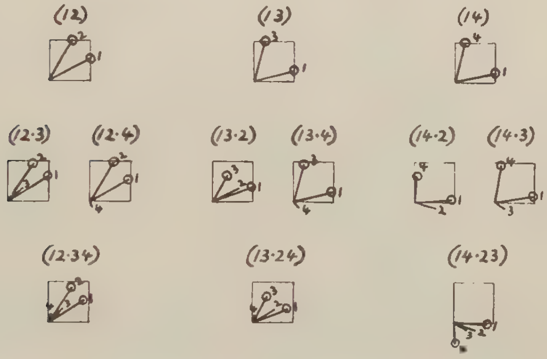


DIAGRAM 2

NORMALISED REGRESSION SLOPES. MAIN INDUSTRIES EXCEPT AGRICULTURE, COAL MINING AND RAILWAYS.



earnings are eliminated, have if anything a negative association with changes in numbers[1].

The extent to which it is possible to explain the variations in the numbers insured by variations in the other factors can be measured in terms of the multiple correlation coefficients between x_1 and the other variables included in the regression equation. Letting $\bar{R}$ denote the multiple correlation coefficient, corrected to allow for the number of observations and the number of variables, the values of $\bar{R}$ obtained in the different sets are given below, together with the values of $\bar{R}^2$; the latter indicates the proportion of the variance of x_1 which is explained by the regression equation.

---

[1] This, perhaps, might have been expected; though, for the same reason, it would be expected that the regression coefficients between x_1 and x_4 in the set (14.2) would be negative, whereas two of them are positive.

TABLE X. MULTIPLE CORRELATION COEFFICIENTS.

Set	$\bar{R}^2$	$\bar{R}$
1.23	.4825	.6946
1.24	.1991	.4462
1.34	.0748	.2734
1.234	.4769	.6906

Thus the two factors relating to earnings account for nearly 50 per cent of the variance of the numbers insured. The addition of x_4 results in the multiple correlation coefficient, when corrected for the number of variables, being slightly reduced, while the exclusion of x_2 or x_3 produces a much lower correlation. The present analysis has not, therefore, produced any evidence that a meaningless correlation has arisen between x_1 and x_2, because of a shortage of labour (see p. 156).

If we decide, in the light of these results, to exclude the variable x_4, the following values are obtained for the normalised regression coefficients.

TABLE XI. NORMALIZED REGRESSION COEFFICIENTS.

β	*Errors minimized in direction of :* x_1	 x_2	 x_3
12.3	.7449	1.6341	1.2577
13.2	.6283	1.0608	1.6825

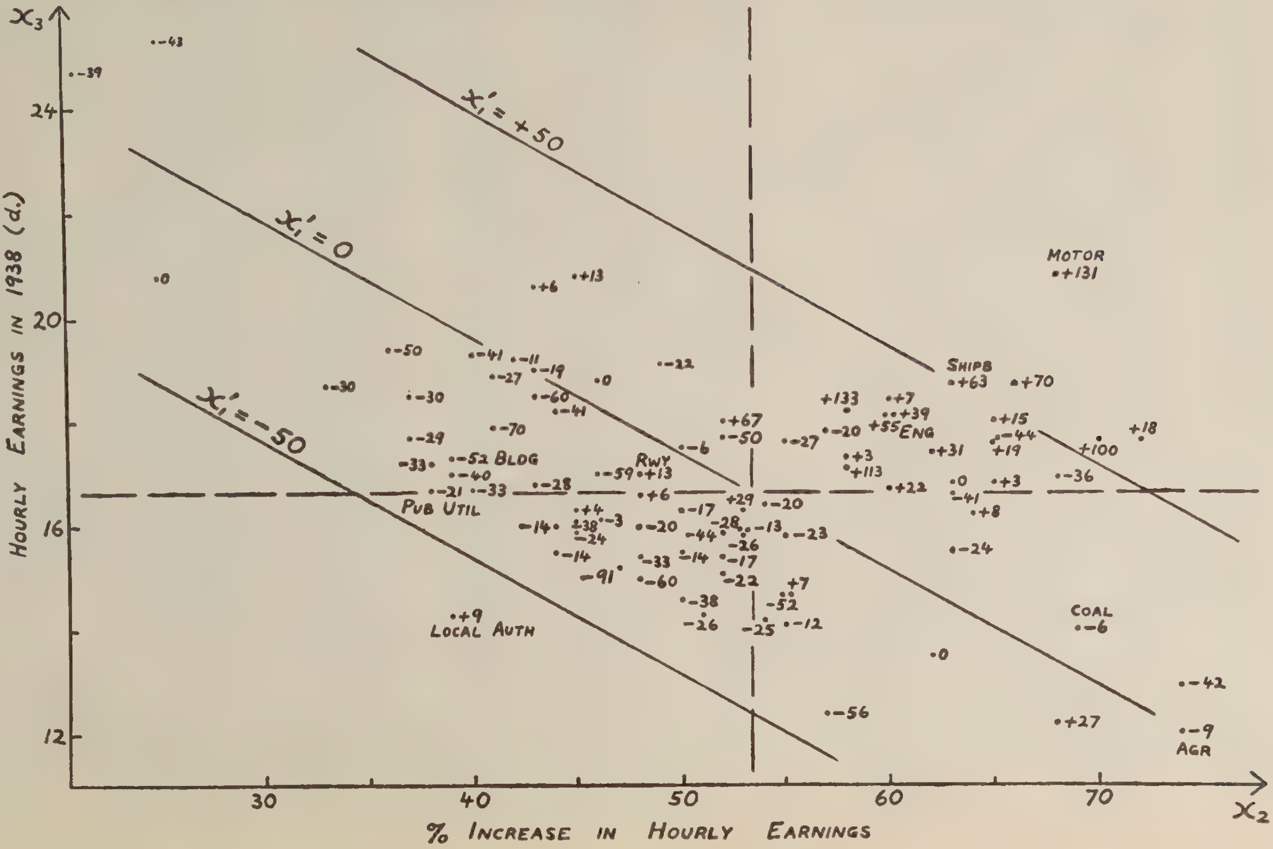
These figures show the relative importance of x_2 and x_3 in the explanation of variations in x_1, on different assumptions about the direction in which errors are minimised. Changes in earnings since 1938 appear to have had a more important influence than the level of earnings which prevailed at that time, except when errors are minimised in the direction of x_3.

Transferring to original units, measured in terms of deviations from the means, and using x_1' to denote expected values, the following regression equation is obtained on the assumption that errors are minimised in the direction of x_1 : $x_1' = 2.65\, x_2 + 11.80\, x_3$
The standard error of estimate ($\sigma_{1.23}$) is naturally rather high, 34.8%. The equation indicates that a relative rise of 10 per cent in hourly earnings was associated, during the period studied, with a relative increase of about 27 per cent in the number of men attached to the industry; and that industries in which hourly earnings in 1938 were higher than the average by 2d. experienced a relative increase in the number of insured men of about 24 per cent.

These conclusions are somewhat surprising, since they indicate that a comparatively small change in either of the variables relating to earnings was associated with a considerable change in the relative number of men attached to an industry.

The relation between x_1, x_2 and x_3 is illuatrated in Diagram 3, where x_2 and x_3 are measured along the two axes and each industry is represented by a point, the number shown beside the point being the value of x_1. Some of the larger industries, namely building, local authorities, public utilities, general engineering, motor vehicles, shipbuilding, coal, agriculture and

DIAGRAM 3.—Relative percentage increase in numbers of insured men (x_1) compared with percentage increase in hourly earnings from 1938 to 1943 (x_2) and hourly earnings (pence) in 1938 (x_3). Regression equation $x_1'=2.65\,x_2+11.80\,x_3$ (measuring from means) shown for $x_1'= +50, 0, -50$.



railways are separately indicated. The mean values of x_2 and x_3 are shown by broken lines (mean $x_1=0$). The three diagonal lines represent combinations of values of x_2 and x_3, corresponding to three theoretical values of x_1, given by the above regression equation.

It can be seen that, although there are considerable divergencies from the values expected according to the regression equation, there is a general tendency for values of x_1 to increase as x_2 and x_3 are increased (i.e. upwards to the right).

The deviations from the regression equation can be further analysed by arranging the industries in groups, according to the differences, measured in terms of the standard error of estimate ($\sigma_{1\cdot 23}$), between the actual values of x_1 and the theoretical values (x_1'). When the industries are classified in this way, we find that the distribution of the percentage numbers insured in 1938, and the corresponding percentages expected according to the Normal Law of Error, are as follows :—

	Percentage Numbers	
Range of $\sigma_{1.23}$	*Actual*	*Normal Law*
under −1.5	3.0	6.7
−1.5 to −0.5	27.4	24.2
−0.5 to +0.5	41.0	38.2
+0.5 to +1.5	20.2	24.2
over 1.5	8.4	6.7
	100.0	100.0

Considering the nature of the problem, the distribution of the deviations between observed and expected values corresponds moderately well with the Normal Law of Error, the Chi-squared test applied to the above figures giving a probability of about 0.5. The correspondence would be much closer, had it not been that in two large groups of industries (local authorities and government industrial establishments) the relative increase in the number of insured men was much greater than is accounted for by the regression equation.

The data are not of a kind which could be expected to conform closely to any known law and there are factors other than wages which affect the mobility of labour. The results of the foregoing analysis are sufficient, however, to establish the systematic character of the connections which have been studied.

Results of correlation analysis, excluding agriculture, coal mining and railways.

The results obtained when agriculture, coal mining and railways are excluded from the analysis are summarised in the tables shown below, and in Diagram 2.

Table XII. CORRELATION COEFFICIENTS.

$r_{12}=.5821$	$r_{12.3}=.6940$	$r_{12.4}=.5939$	$r_{12.34}=.7630$
$r_{13}=.2901$	$r_{13.2}=.5741$	$r_{13.4}=.2691$	$r_{13.24}=.6460$
$r_{14}=.2153$	$r_{14.2}=.0848$	$r_{14.3}=.1775$	$-r_{14.23}=.0944$
$-r_{23}=.1408$	$-r_{23.1}=.5114$	$-r_{23.4}=.2251$	$-r_{23.14}=.6142$
$r_{24}=.2812$	$r_{24.1}=.2472$	$r_{24.3}=.3303$	$r_{24.13}=.4301$
$r_{34}=.2054$	$r_{34.1}=.1637$	$r_{34.2}=.2714$	$r_{34.12}=.4621$

TABLE XIII.

NORMALISED REGRESSION COEFFICIENTS.

β	*Errors minimized in direction of :*			
	x_1	x_2	x_3	x_4
12.34	.6508	1.5554	.9624	4.6131
13.24	.3916	.5791	1.8371	3.5223
14.23	—.0481	—.3409	—.4327	—12.5737
12.3	.6356	1.4701	.8323	—
13.2	.3796	.4971	1.7770	—

TABLE XIV.

MULTIPLE CORRELATION COEFFICIENTS.

Set	$\bar{R}^2$	$\bar{R}$
1.23	.4674	.6837
1.24	.3257	.5707
1.34	.0878	.2962
1.234	.4629	.6804

These results, though naturally differing considerably in detail from those obtained in the more complete analysis,[1] do not in any way modify the main conclusions. The correlation is not quite as high as before, but the correspondence between the two sets of bunch maps (see Diagrams 1 and 2) is very close. Further discussion of these results is therefore unnecessary.

In original units, measured in terms of deviations from the means, the regression equation between x_1, x_2 and x_3, on the assumption that errors are minimised in the direction of x_1, becomes as follows :

$$x_1' = 2.87\, x_2 + 9.43\, x_3 \qquad (\sigma_{1.23} = 38.4)$$

which is not substantially different from the equation previously obtained.

Final Remarks

It should be remembered that this analysis refers to a period of transition from peace to war, when radical changes had to be made within a comparatively short space of time and the general level of employment was rising. Whether a study of more normal conditions would lead to similar conclusions is a problem which remains to be investigated. The results which have been obtained are nevertheless of interest and appear to have a bearing on the situation at present, when men are returning to peace-time occupations. If it is true, as the present findings suggest, that wages can serve as a strong incentive in bringing about the necessary re-allocation of labour, then it is important that a wage policy should be formulated and wage differentials adjusted, having some regard for prospective man-power requirements.

J. L. NICHOLSON.

---

[1] In particular, the negative correlation between the percentage change in earnings from 1938 to 1943, and the level of earnings in 1938, is substantially reduced when the three industries mentioned are excluded.

TABULAR APPENDIX.

EDITORIAL NOTE

Tables relating to British economic developments, are given below. As far as possible 1938 is taken as the base year for index numbers. Absolute figures for any year are generally given as monthly or quarterly averages to ensure comparability. Detailed information about the different series can be found in the sources quoted.

Explanation of symbols used.
(. .) — figure is provisional or approximate.
N.A. — figure is not available.
— — figure is negligible.

A. ECONOMIC DEVELOPMENTS IN GREAT BRITAIN.

Table I

Employment by Industries in Great Britain

	Total						
Million persons employed	Mid 1939	Mid 1943	Mid 1945	1945 Oct.	Dec.	1946 Jan.	Feb.
1. Metal and Chem. Ind.	N.A.	N.A.	4.35	3.78	3.64	3.54	3.52
(*a*) for Civilian Use	2.04	0.92	1.21	1.85	2.33	2.43	2.57
(*b*) for Supply of Forces	N.A.	N.A.	3.14	1.93	1.31	1.11	0.95
2. Other Manufactures	N.A.	N.A.	2.58	2.69	2.75	2.60	2.64
(*a*) for Civilian Use	3.63	1.75	1.82	2.11	2.25	2.14	2.24
(*b*) for Supply of Forces	N.A.	N.A.	0.76	0.58	0.50	0.46	0.40
Total Manufactures	*6.90*[1]	*7.85*[2]	*6.93*	*6.47*	*6.37*	*6.42*	*6.46*
% for Civilian Use	81	34	44	61	72	71	75
% for Exports	(14.5)	3.2	6.9	12.0	14.2	15.4	16.6
3. Basic Ind. and Services	4.68	5.03	5.11	5.11	5.11	5.14	5.17
(*a*) Agriculture, etc.	1.11	1.12	1.11	N.A.	1.01	1.01	1.01
(*b*) Mining and Quarrying	.87	.82	.80	.78	.79	0.79	0.79
(*c*) Transport, Shipping, Fishing	1.27	1.19	1.26	1.29	1.31	1.33	1.35
(*d*) Govt. Service (Nat.+Local)	1.39	1.79	1.82	1.80	1.79	1.79	1.79
4. Building and Civ. Eng.	1.31	0.73	0.72	0.81	0.90	0.94	0.96
5. Distributive Trades	2.89	2.01	1.96	2.01	2.05	2.07	2.09
6. Other Services	2.11	1.51	1.49	1.51	1.54	1.56	1.58
Total Employed[3]	17.91	17.12	16.21	15.90	15.91	16.12	16.25

Source : *Ministry of Labour.*

[1] Including 1,27 million engaged in producing equipment and supplies for Forces.
[2] Including 5,18 million engaged in producing equipment and supplies for Forces.
[3] Excluding Forces and Auxiliary Services, Civil Defence and Police, and private domestic service.

TABLE II

Regional Distribution of Insured Persons and of Numbers of Registered Unemployed (000's).

	Insured Persons[1]			Register'd Unemployed[2]				
July ..	1939	.1943	1945	1939[3]	1943	1945	Jan.'46	Mar. '46
London and S.E. ..	3,655	3,024	2,861	170	13.9	11.6	24.5	30.8
Eastern	737	729	676	37	2.3	2.1	8.6	10.4
Southern	629	669	619	43	1.8	1.7	7.7	8.2
S. Western ..	737	756	698	34	2.0	2.8	9.0	10.1
Midlands	1,501	1,534	1,378	82	2.4	8.1	24.0	21.9
North Midlands ..	1.098	1,051	979	71	1.7	2.0	9.3	10.5
North and Eastern	1,437	1,333	1,237	121	4.9	6.6	17.1	19.4
North Western ..	2,396	2,250	2,072	286	10.2	13.1	50.5	63.4
Northern	850	832	817	116	7.7	11.7	45.2	50.3
Scotland	1,650	1,555	1,463	190	16.7	22.0	63.7	74.1
Wales	687	721	678	106	9.7	21.3	68.2	69.6
Northern Ireland ..	348	370	358	70	17.2	17.0	30.8	32.5
Total	15,157	14,292	13,300	1,326	91	120.4	360!2	404.4

Source: *Ministry of Labour Gazette.*

[1] Estimated number of insured persons aged 14 and over under the General Scheme and the Agricultural Scheme in July in each Region as contributed in July 1945.

[2] Number of wholly unemployed persons registered at Employment Exchanges; including casuals and temporarily stopped.

[3] Excluding Northern Ireland.

TABLE III

Symptoms of Investment Activity in U.K.

Monthly Average Rates	*1938*	*1945*	*1945 1st qr.*	*1946 1st qr.*
Output of Cement[1] ('000 tons)	643	338	250	409
Index 1938=100	100	52.6	38.9	63.6
Output of Bricks[2] (million)	610	102	95	154
Index 1938=100	100	16.7	15.6	25.3
Home Deliveries of Steel ('000 tons) ..	818	962	1053	885
Index 1938=100	100	117.6	128.8	107.2
Merchant Shipbuilding[3]	780[6]	1476	1091	1586
Index 1938=100	100	189.2	139.9	203.3
Commercial Vehicles[4] Produced (No.) ..	(4201)	4683	3237	8990
Index 1935=100	100	111.5	77.1	214.0
Deliveries of home-produced Machine Tools[5] (£'000)	N.A.	4146	6371	N.A.

Sources: *Board of Trade Journal, Accounts Relating to Trade of U.K.* and *Statistical Digest.*

[1] Figures relate to nearly all the firms in the industry.

[2] Great Britain.

[3] Thousand gross tons under construction at end of period (all ships of 100 gross tons and over, including merchant type vessels built for the Navy).

[4] Including omnibuses, but excluding service vehicles. For the base year 1935 the number of service vehicles cannot be separated.

[5] Value of Metal and Woodworking Tools, Electric Motors and Welding Sets.

[6] These figures have been taken from Lloyd's Register and are not strictly comparable with the figures in the rest of the table. The Lloyd's figures refer to U.K. + Eire, and include certain non-propelled lighters.

TABLE IV

Coal Production and Employment

	1938	1944	1945	1945				1946
	Quarterly Averages			1st qr.	2nd qr.	3rd qr.	4th qr.	1st qr.
Mined Coal—								
Saleable coal produced (000 tons) ...	56,748	46,025	43,471	45,497	43,687	39,672	45,029	45,219
Av. number of effective[1] wage earners (000's)...	N.A.	641.6	628.9	647.7	648.8	592.6	626.6	626.2
Opencast Coal[2]—								
Saleable coal produced (000 tons) ...	—	2,162	2,029	1,887	2,208	2,051	1,971	1,709
Av. Output per man-shift worked (tons)	1.14	1.00	1.00	0.99	0.99	0.97	1.02	1.02
Av. ditto at the face[3] ...	3.00	2.76	2.70	2.68	2.68	2.65	2.77	2.76

Sources : Ministry of Fuel and Power *Statistical Digest* and *Board of Trade Journal.*

[1] Effective numbers exclude those absent for the whole of any week.

[2] Government opencast operations were commenced in 1942.

[3] Additional categories included as workers at the coal face from 1943, causing apparent reduction in average output by about 4%.

TABLE V

Retail Sales and New Supplies of Certain Consumer Goods (1943=100).

	1938	1944	1945	1944 Nov.-Dec.	1945 Jan. Feb.	1945 Nov.-Dec.	1946 Jan. Feb.
Index Numbers of Retail Sales							
Total Sales	96	107	114	121	103	133	111
Food & Perishables...	90	105	110	106	103	115	109
Non-Food Merchandise ...	105	109	122	136	102	164	115
Index Numbers of New Supplies for the Home Civilian Market.[1]							
Footwear[1]	(140)	95	96	92	93	99	102
Other Clothing[1] ...	(190)	90	93	84	93	100	111
Furniture & Furnish'g[2]	(420)	124	201	139	157	264	316
Hardware[2]	(280)	94	117	100	103	150	N.A.
Beer[3]	82	105	109	102	99	112	100
Spirits[4]	107	91	91	95	91	100	96
Tobacco[5]	86	99	105	99	104	114	112

Sources : *Board of Trade Journal* and *Monthly Digest of Statistics.*

[1] Based on coupon values.

[2] According to value at pre-war prices.

[3] Based on bulk barrels on which beer duty paid.

[4] Based on proof gallons on which duty paid.

[5] Based on net clearances mainly by manufacturers for home consumption.

TABLE VI

1. *Retail Prices*

	General Market Price Index		Ministry of Labour Cost of Living Index[1]				
	1944	1945	1944	1945			1946
	yearly averages (av. 1938=100)		yearly	averages (av. 1938=100)	July	Nov.	Mar.
Food	136	137	120	120½	125	120	120
Rent	102½	103	102½	103½	104	104	104
Clothing	179½	185	165	166	166	165	165
Fuel and light	133½	138	142	150½	152	152	152
Miscellaneous	176	177	166	166½	166	167	167
All Items	151	153	129	130	133	130	130

Sources : Cmd. 6784 (weights in current years) and *Ministry of Labour Gazette.*

[1] Prices on 1st of month.

2. *Board of Trade Index of Wholesale Prices.*

(1938=100)	1938	1939	1940	1943	1944	1945	1946 March
Basic Materials	100	107	159	187	198	201	199
Intermediate Products ...	100	102	139	164	168	173	182
Manufactured Articles ...	100	99	119	138	141	143	150
All Articles	100	101	138	161	164	167	169
Building Materials	100	101	117	144	147	150	156

Source : *Board of Trade Journal.*

3. *Import and Export Prices*[1]

	Imports					*Exports*			
1938=100	Dec. 1939	Dec. 1945	Jan. 1946	Feb. 1946		Dec. 1939	Dec. 1945	Jan. 1946	Feb. 1946
Food, etc. ..	123	195	199	200	Textiles ..	110	230	235	239
Raw materials ..	137	218	219	218	Metal goods ..	102	171	176	180
Manufactures ..	142	177	175	175	Total Manuftrs.	106	186	190	192
Total	130	198	200	200	Total	106	186	189	191

Source : *Board of Trade Journal.*

[1] The indices measure the change in the aggregate value of a representative selection of imports or exports. For methods of calculation see *Board of Trade Journal,* April 13th, 1946.

TABLE VII

Ministry of Labour Index of Wage Rates[1].

	1944	1945	1945			1946		
	yearly averages		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Index (av. 1938=100) ..	142½	149	151½	152	153	155	157	158

[1] Monthly indices based on average rates at end of two successive months.

Table VIII

1. *United Kingdom Imports of Certain Commodities.*

(Thousand tons per month).

Commodity	*1938*	*1945*	*1945 1st qr.*	*1946 1st qr.*
Wheat and flour	455	341	203	324
Maize and feeding stuffs	411	59	64	18
Meat of all kinds	129	97	121	114
Butter	39	16	23	21
Fresh fruit and vegetables	176	38	79	69
Tobacco	13	14	15	15
Iron Ore[1]	425	340	244	480
Cotton[2]	43	32	24	24
Wool[2]	23	16	13	17

Source : *Accounts Relating to Trade of U.K.* and *Monthly Digest of Statistics.*

[1] Other than manganiferous ore.

[2] Retained Imports.

2. *Exports of Produce and Manufactures of U.K.*

Class of article	*Index numbers of volume* 1938	1945	1945 4th qr.	1946 1st qr.
Food, drink and tobacco	100	89	90	88
Coal	100	8	13	14
Machinery	100	49	60	83
Cotton yarn and manufactures	100	34	34	43
Woollen andworsted yarns and manufactures	100	39	43	76
Silk and articificial silk yarns and manufactures	100	114	100	145
Chemicals	100	104	117	165
Vehicles	100	23	37	86
Articles mainly or wholly manufactured	100	45	55	91
All exports	100	45	55	84

Source : *Board of Trade Journal.*

3. *Retained Imports, Exports of U.K. Produce and Balance of Merchandise Trade.*

Monthly Average. Value : £ million. Index : 1938=100.	1938	1939	1944	1945	1946 1st qr.
Ret. Imports Value	71.5	70	107.6	87.6	88.8
Vol. Ind.	100.0	96.8	80.2	63.0	63.0
Exp. of U.K. Produce	39.2	36.6	22.1	32.8	61.4
Vol. Ind.	100.0	94.3	31.4	31.0	81.0
Balance of Merch. Tr. (Value)	32.3	33.4	85.1	54.8	27.4

Source : *Accounts Relating to Trade of the U.K.*

ERRATUM.

Grocery Sales and Rationing (BULLETIN, Vol. 8, No. 4), Table III : Under ' 155 Household Accounts ' : *Butter* read 2 ounces instead of 3 ounces.